THE MONTHLY

Review

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Third Vice-Pres. - RAYMOND O'CONNOR

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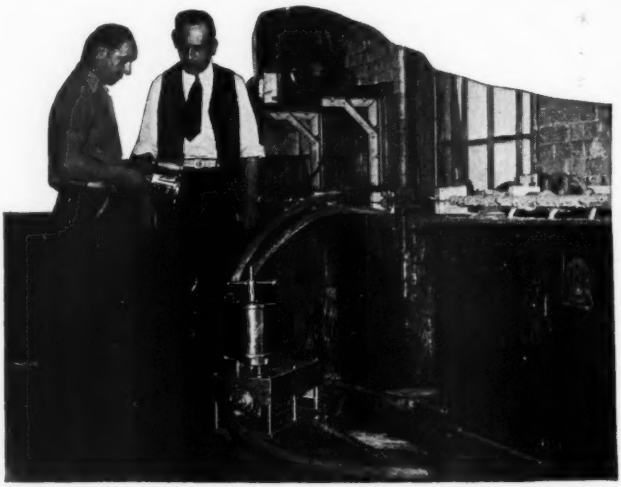

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CONVENTION HIGHLIGHTS

By
MAURICE R. CALDWELL
President

Our 1944 Convention is over. Many who were responsible for certain functions have a feeling of relief. Others, who obtained a few new ideas, will figure the time well spent. Still others will never forget this convention, as it provided the meeting place for many old friends.

The interest and attendance at most of the educational sessions reached a new peak. This is especially encouraging for those who tried to make the meetings successful.

The new method for "Exhibits" was well organized and created considerable interest. As you will recall, this consisted of interesting articles—whether it be the first generator manufactured or a complete library of books. This was an original idea by Walter Pinner, now our First Vice President, and is worthy of being continued until we are able to have actual exhibits of plated ware again.

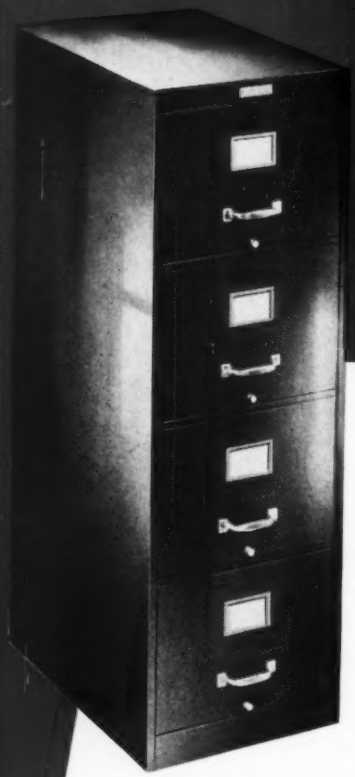
The total registration reached an unprecedented figure, which was approximately 1,260. There are evidently more electroplaters in this country than ever before. We can be sure that each registrant came to learn something. If the attendance at the educational meetings and the general discussions in the halls and lobbies are any indication—the convention was a success.

Yes, the convention was very successful. A great deal of credit is due the personnel of the Cleveland Branch, who handled the programs. The ladies program kept our "guiding lights" well entertained, so that we could attend to business and—I mean business.

At the business meeting the delegates voted down each of the proposed amendements. Let everyone be informed that the members of the Society like the name "American Electroplaters' Society." He who attempts to change it, must have something pretty good—which to date has not been found.

The "Research" Committee met and discussed at length the many problems. The program is going to be continued this year. A new Chairman will be appointed and soon an announcement made as to a tentative program. The delegates voted to transfer $2,000 from the fund of the National Society to the Research fund. This means each member is contributing a small amount in support of the worthwhile work.

Next June we hold our Convention in Pittsburgh. It is not too early to start planning. Pittsburgh is well located—the Hotel facilities seem adequate and the Branch is real active. Therefore, we are certain of another good Convention is 1945.



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"CONVENTION"

By E. T. CANDEE

THE 32nd Annual Convention of the American Electroplaters' Society has come and gone, and the success of the Convention has again proven that the Society is a growing one and is keeping up with its industry. Not many years ago the Society had four to five hundred members at a Convention; this year's registration totaled more than twelve hundred. As in the past two years the Convention lasted three days instead of four, cutting out some of the pleasure side of the Convention to some degree. The importance of the Convention to the members and visitors was proven by the number of people who came and stayed one or two days and then had to leave because of the pressure of business. Men do not do this unless they have a real need for the papers read at the Convention.

In spite of the size of the Convention and the problem of handling the unexpectedly large registration, all details went off smoothly. The Committee under the General Chairmanship of Mr. Scott is to be commended on the success of their efforts.

The Convention opened Monday morning with short talks by Mr. Svenson, President of the Cleveland Branch; Mr. Scott, General Chairman of the Convention; and Mr. George Wagner, President of the A.E.S. The meeting was opened by a prayer from Frank Mesle, one of our own members. It was then followed by a short Educational Session which was completed at noon. A second Educational Session was held Monday afternoon followed in the evening by the International Fellowship Club Open House. As usual the Open House was a great success and gave the first opportunity for everyone to relax, renew old acquaintances, and strike up new ones. It was fortunate that the hotel facilities were as ample as they proved to be since the crowd at the Open House exceeded anything that has been seen heretofore, thus requiring more service, more space, and more food. Three additional sessions were held Tuesday morning and afternoon and Wednesday morning completing the five Technical Sessions of the Convention. In order to complete the discussion which had been handicapped by the lack of time, an informal meeting was held Tuesday evening to discuss the various papers on Chromium Plating. Like all other sessions this was well attended.

At the Victory Luncheon Tuesday Noon, Fred A. Hartley, Congressman of New Jersey, spoke particularly on the conditions in Government Bureaus, spending most of his time on The Office of Price Admin-

istration. Congressman Hartley was a particularly good choice for this Noon Luncheon since he illustrated his point about Bureaucracy and the seriousness of some of the conditions which now exist in Washington, but at the same time he was able to find humorous incidents, thus making the talk enjoyable as well as enlightening.

The Wednesday Afternoon Business Meeting went off smoothly under the gavel of President Wagner. There were 16 Amendments proposed to the Constitution; one by Newark and 15 by the Montreal Branch. The Newark Amendment was defeated by a roll call vote; the first three of Montreal were defeated by a show of hands and the balance of the twelve Amendments were tabled, thus making it possible to bring them up before the Convention next year.

The reports of the various Committees were given, including the Paper Awards Committee and the Exhibit Awards. Details of these awards will be found elsewhere in this issue.

The budget was acted on and it is interesting to know that the budget is now approximately three times what it was five years ago, indicating growth of the Society.

The last two items of business in the Convention were the election of officers and the selection of the Convention City for 1946. The officers elected for the ensuing year are: President, Maurice R. Caldwell; First Vice-President, Walter L. Pinner; Second Vice-President, Frank K. Savage; Third Vice-President, Raymond J. O'Connor. All officers were unanimously elected by the members. The Pittsburgh Branch invited the Convention to their home town for next year and the members voted unanimously to go there.

The greatest problem of the Convention Committee came Wednesday night at the Banquet. There was space for approximately 100 less people than the Banquet Hall would hold and Mr. Miller, Chairman of the Entertainment and Banquet Committee, had the problem of finding place for these people. The hotel made the other dining rooms available to those who could not get into the Banquet Hall. After eating they all joined in the Banquet Hall to see the entertainment.

It is hard to describe Conventions to those who do not attend as it may seem that they all fall into a similar pattern and there is nothing new that happens. However, every Convention is different because it is organized and run by a separate group of people, and the personality of the Convention is determined by those who are in charge. The Cleveland Convention was particularly outstanding due to the close cooperation between the various Chairmen and their unstinting efforts in fulfilling their duties, making it pleasant for all who attended.

EXHIBITS

Third Vice-President Walter L. Pinner and Mr. Louis Piovarcy together worked on the plan for an exhibit of unusual things and hobbies. Like all new ideas and new shows, there was a question of how much interest would be aroused by this exhibit. The list of awards with a short description of each exhibit is an indication of the interest aroused.

BRANCH AWARDS:

First Prize — Bridgeport Branch

The Bridgeport Branch exhibit included several old typewriters made by Bridgeport Companies in days gone by. These were museum pieces and gave an excellent contrast of office equipment today and office equipment of the earlier days of the century. A second exhibit was a board giving complete details of the life of the oyster. Various samples were displayed showing the oyster from a few days to eight years old, and showed the various types of parasites which feed on the oyster. Even to the Easterners who are near oysters, this was a particularly interesting exhibit. A third exhibit was a model house carved by hand. The model was complete in every detail and was lit to make it even more realistic.

Second Prize — Dayton Branch

The Dayton Branch made an unusual effort to show the various steps in zinc plating from the ore right through to the final product. They had samples of various steps with schematic diagrams to show the various steps through which it went, and the members of the Dayton Branch who prepared the exhibit are to be commended on their energy in producing such an exhibit.

Third Prize — Baltimore-Washington Branch

The third prize was awarded to the Baltimore-Washington Branch. Among the exhibits in this display was a large model railroad engine illustrating the various parts of an engine that are electroplated.

INDIVIDUAL AWARDS:

The first prize for individual awards went to Mr. George Hogaboom without any doubt. Mr. Hogaboom filled a show case with first editions of various books, magazines, and pamphlets; some of them going back to the 19th century and many of them autographed by the authors. Many people studied this exhibit for a long time in an effort to learn more of the history of plating and more of the literature on the industry.

The second prize was awarded to Mr. Edgar Proctor, son of Charles H. Proctor, who showed many of the intimate personal belongings of

Charles Proctor. Among these were his books and note books on plating, his masonic apron and emblem, and other momentoes which were close to the members of the Society.

The third prize was probably most interesting to many, it being a collection of small individual bottles of liquor. We estimate there were between 75 and 100 types of liquor in individual bottles. The most common comment was that it was too bad the showcase was locked.

INDUSTRIAL AWARDS:

The first prize for Industrial Awards was made to the Hanson-Van-Winkle-Munning Company for their display of old time generators. If these are not the first generators of the industry, they are close to it. The generators have been reconditioned so that they are in working order and they make an excellent choice, in fact they are what might be considered museum pieces.

The second prize was awarded to the Harshaw Chemical Company for their exhibit showing various laboratory equipment and its use for laboratory analyses.

The third prize was awarded to the Divine Brothers Company for their display of the various buffing wheels, and buffing compounds which are available.

Few people realize the problem which fell to Mr. Piovarcy and Mr. Pinner in the setting up and the arranging of these exhibits. Many of them were sent in and the owners were not there to describe how they should be displayed, and very little information was available as to the quantity of display that would be on hand. Both men with their several assistants are to be congratulated on their success of their efforts.

PAPER AWARDS:

A review of the various papers given at the Convention is given elsewhere in this issue, but the awards for the best papers are of general interest to all.

The Proctor Award of $100.00 for the best paper presented by anyone at the Convention went to Mr. T. C. Coyle for his paper entitled, "Porous Chrome Plating." Mr. Coyle's paper is the first complete paper which has been given on Porous Chrome Plating and gave the complete story without apparent reservation. This award was announced and the presentation was made at the Convention, and Mr. Coyle is to be congratulated on the paper presented to the Convention.

The Founder's Gold Medal award for the best paper presented by a member of the Society was awarded to Mr. Frank Savage for his paper entitled "Electro-forming." It is interesting to note that again the award was made to the Chairman of the Awards Committee over his own protest, and in spite of the fact that he did not vote for his own paper. The

fact that his own refusal to vote did not keep him from winning the award is ample evidence that his paper was entitled to the Founder's Gold Medal.

The A.E.S. $50.00 award for the best paper presented in the *Monthly Review* was awarded to Dr. C. S. Lowe for his paper entitled, "Precleaning With Solvent Emulsions." This award means considerable since it has to compete against all the papers presented in twelve issues of the *Review*.

The A.E.S. Gold Medal for the best paper presented by a member in the *Monthly Review* was awarded to Mr. W. S. Morrison for his paper entitled, "Synthetic Cation and Anion Exchange Resins As New Research Tools In The Field of Electrodeposition And Related Art." This paper was unofficially given at the Buffalo Convention due to a demand of several members, but since it did not appear in the Program, was published in the *Monthly Review*. Mr. Morrison is to be congratulated for his paper on a new subject and receiving this award.

It is unfortunate that many of the branches no longer present papers at the Convention and because of this there is no competition for the Branch Paper Award. Many fine papers have been written in the past on this subject and it is hoped that the branches will gradually renew their habit of preparing papers.

It would not be proper to complete the report of the Convention without mentioning several members of the Convention Committee whose work was outstanding. Although Mr. Honnecker's work was largely completed before the Convention, he did an excellent job taking care of the needs of those who were to read papers and saw to it that the proper equipment was available at the meetings.

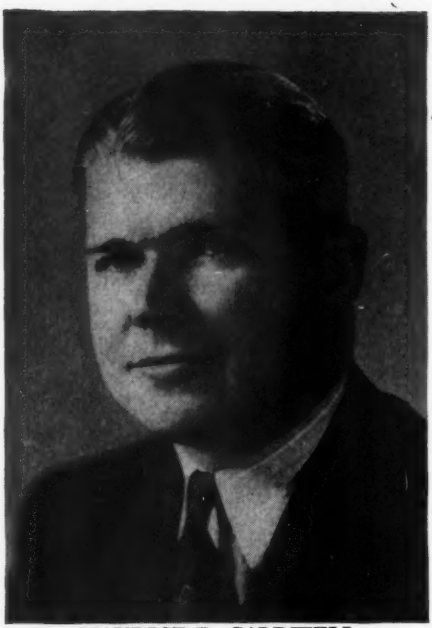
The registration under the Chairmanship of Mr. O'Berg went smoothly in spite of the fact that 1200 people registered within a day and a half; no one had to stand in line for any great length of time. It was surprising to see how fast the lines moved and how smoothly the registration was handled.

Another man who had a difficult problem was Mr. Ross Lyons who was in charge of hotel reservations. The hotels had been sold out approximately two weeks before the Convention and it was his job to make arrangements for the late arrivals so that they would have a place to stay. Although some had to stay at some distance from the hotel, none were without sleeping quarters.

Mr. E. Steen Thompson was in charge of publicity and was available at all time for help, in fact, many times assisted other people to solve difficulties that arose.

The Convention Committee is to be congratulated for their efforts and it is hoped that Pittsburgh will be as successful as Cleveland.

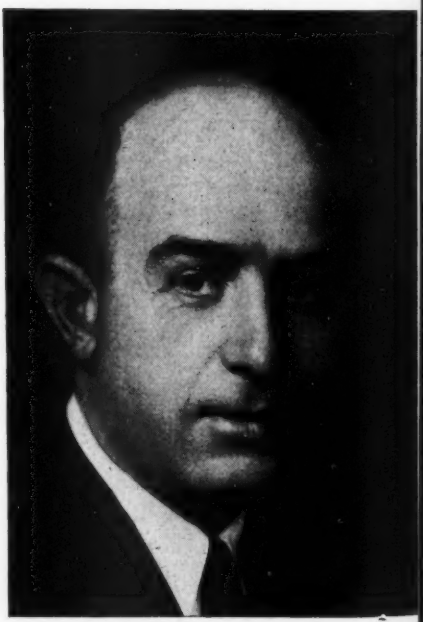
National Officers



MAURICE R. CALDWELL
Supreme President

Born 1901 at Montgomery, Alabama. Completed H.S. 1918 and received B.S.E. degree University of Michigan 1923. On graduation was employed by C. G. Spring Co., which subsequently became a division of Houdaille-Hershey Corp. Present position Chief Chemistry Engineer.

Have published a number of papers principally in S.A.E., Electro-Chemistry Society, and A.E.S. Highly prize the honor of being four times gold medal winner of A.E.S. President of Detroit Branch two years and served as Secretary of Electrodeposition Division of Electro-Chemistry Society. In addition am a member of A.S.M.



WALTER L. PINNER
First Vice-President

Graduated from Michigan State College June 1928, receiving a B.S. degree, having majored in electro chemistry. Employed at Dodge Brothers Division of the Chrysler Corporation from August 1928 to February 1934 as analytical chemist, having control of all electroplating solutions.

Employed from February 1934 to February 1935 by Yale & Towne Mfg. Company, Detroit, in charge of plating operations.

Employed by W. B. Jarvis Company since February 1935 as Plating Supervisor in charge of the Laboratory, research, and plating department.

A. E. S. 1944 - 1945

FRANK K. SAVAGE
Second Vice-President

B.S. Degree in Chemical Engineering, Michigan State College, 1935. Employed by C. G. Conn Ltd., Oct. 1, 1935 as Chemist.

Plating Room Foreman, 1937.

Chief Chemist in charge of research and development, 1939.

Ch.E. Degree (Professional), Michigan State College, 1941.

President, Chicago Branch AES, 1941-42.

General Superintendent, C. G. Conn Ltd., July 1942.

RAYMOND J. O'CONNOR
Third Vice-President

Born May 7, 1895, Naugatuck, Conn., and educated in schools of Naugatuck and Waterbury, Conn.

Laboratory of Chase Brass of Waterbury, Conn., 1910-1916. Served as chief chemist for Connecticut Brass and Mfg. Co., at Waterbury 1916-1919.

From 1919-1921 served as Laboratory technician for Bridgeport Brass Co.

Joined Contract Plating Co., Inc. at Stratford, Conn., in 1921, and today hold the position of President and Treasurer.

Served as National Chairman of Research of A.E.S. from 1925 to 1930. In 1930 elected First Vice-President of the Supreme Society of A.E.S.

ELLSWORTH T. CANDEE
Executive Secretary

Born in Waterbury, Conn., where I attended grade and high school. Received degree of Chemical Engineer from Rensselaer Polytechnic Institute, and upon graduation joined the American Brass Company. In 1934 was transferred to the American Metal Hose Branch as technical supervisor. Currently employed as Technical and Development Supervisor.

Joined A.E.S. in 1928, serving the Waterbury Branch in various capacities, subsequently office of President 1940-1941. Elected First Vice-President National Society and President 1941-1942. Recently appointed Executive Secretary by President Wagner.

Born near Marion, Ohio, where I attended grade and High School. Received A.B. degree Oberlin College 1924.

Became sales representative for Roy Manufacturing Company and later Eastern Sales Manager.

General Manager Washington School of Art 1930-32.

Formed publishers representation business and during the years handled advertising sales for many publications. Became advertising representative for the MONTHLY REVIEW in 1941 and Publisher-Business Manager in 1942.

JACK BAIN
Publisher and Business Manager

Zinc Plating For Lubrication In Ironing and Drawing*

By HAROLD A. SHEPARD

THE deep drawing and ironing of steel for ordnance materials has been made possible through the medium of ductile zinc plating.

To you who are unfamiliar with the deep drawing or ironing of metals, an explanation is in order. The process is one whereby metal stock is formed and drawn into the semi-finished product. I say semi-finished because it is sometimes necessary to go through intermediate operations such as plating and etc. The draws at any stage may exceed twice the length of the previous operation. The final drawing operation in this case is really an ironing operation which irons the metal out to the desired wall thickness and length. The zinc plate provides the where-with-all to do this.

Why use zinc? Why not use some other plate with inherent ductile characteristics? There are numerous plates that would do, but the most efficient and economical plate had to be found. Zinc was decided upon for the following reasons.

The plate had to be capable of giving a porous base to the coat of soap which is applied prior to the ironing operation and at the same time be able to iron out with the steel evenly and consistently.

A standard Zinc bath with average Qualities will give good service both as to ductility and finish, but the same bath with certain modifications and with ductility and service as the primary factors will give even better results, although some

*Awarded Lamoreux prize for best paper presented to Los Angeles Branch.

sacrifice of appearance will result. The true ductile plate will very likely be a crystaline white in color. Ductility is a requisite for a lubricating plate. Close control will give the wanted results.

Because of very fine tolerances between dies and punches, it is necessary that the plate must not vary in either thickness or hardness. A thousandth over or under the desired results could cause considerable damage to the finely finished surfaces of the ironing tools. Thickness of plate must be checked constantly. The G. E. Gauge and the Magna-gauge provide handy and accurate tools for this purpose. In order to give corrosion resistance to the finished product .001″ is applied to the outside and .0005″ to the inside before ironing. After ironing, the product is twice as long as before and, the plate must check .0005″ on the outside and .00025″ on the inside. This means that the plate is forced to iron out with the base metal and cover twice as much area as before ironing and yet give satisfactory resistance to the corrosive action of salt air. That is service and ductility plus.

Economy is an item that must not be overlooked. There must be economy of raw materials, equipment, personnel and process. The cyanide zinc plating process is comparatively simple and the constituents are reasonable in price and relatively plentiful in supply. Equipment is simple and easy to maintain. The problem of personnel in these times is serious but can be overcome by instituting a training program thus keeping the experienced supervision down to a minimum.

The problems involved in a process of this type where production and service of product are of paramount importance are complex indeed.

Cleaning before plating involves several operations. Where oil or drawing compounds are used on earlier operations it is necessary to pass the work through a vapor degreaser and then because of stresses set up by previous drawings the work must be annealed. The semi-processed steel is

annealed in reducing atmosphere at 1325°F., water quenched, and then sent through automatic pickle equipment for scale removal. The pickle is closely controlled both as to iron and acid concentration. We find it advisable to use an inhibitor to reduce the attack by the acid upon the steel. There is a short period of time that may elapse before the work is placed on the plating conveyor, and to insure against rust from exposure to the atmosphere it is passed through a bath of trisodium-phosphate.

The nature of the following machine operations demands perfect adherence of the plate to the base metal. This in turn demands the cleanest possible surface upon which to plate. Anodic cleaning is used because of the speed and efficiency with which it cleans. The use of highly concentrated prepared cleaners in fairly low concentrations, at below boiling temperatures make the use of this type of cleaning very economical. So thorough was the cleaning taken care of by one reverse cleaner that the other anodic cleaner originally called for in the set up was not needed and was converted into an alkaline rinse.

The pH is rigidly controlled and held at 12.0. Following the cleaners there are fresh water rinses and then a sulphuric acid rinse at 8% by vol. to help remove any silicates that may be on the surface and to give an active base on which to apply zinc. Two neutralizing rinses follow the acid rinse and then a sodium cyanide bath to impart a thoroughly alkaline surface before plating.

The constituents of the cyanide zinc bath are familiar to most of you. Only the concentrations for the various purposes to which the bath may be put are likely to vary much. In zinc plating for ironing purposes the emphasis must be on ductility, thus the bath must be constructed and controlled accordingly.

In the development of the zinc bath at Norris Stamping a great deal of credit must go to D. N. Eldred of the DuPont

Co. As service supervisor for that company he was of great assistance to us. The specialized bath in use on this War Production Work consists of 64,000 gallons and is divided into two lines of four plating tanks each plus certain other auxiliary tanks. The constituents are typical of any cyanide zinc bath. The bath is somewhat modified to suit the purpose for which it is being used. Sodium cyanide, sodium hydroxide, and zinc in the form of zinc oxide are the principal ingredients of the solution. The analytical concentrations must remain, for the present unprinted. Some variations may occur in the ratio of total cyanide to zinc, however it is advisable to control within 2 or 3 tenths. The bath undergoes a daily analyses and the additions to the bath are regulated accordingly.

Zinc for the bath is obtained from zinc oxide. The consumption of zinc in this bath is higher than would be for a normal operating solution. This is because of our use of an insoluable inside anode, this, of course means larger additions of oxide. In order to prevent certain impurities from entering the bath through these large additions, a purification program must be carried on. Various groups have done experimental work on this problem and our organization is no exception. The best results seemed to be obtained through the use of sodium sulphide in predetermined amounts. The use of sulphide for cyanide zinc baths is a DuPont process, but the application of sulphide is not one which lends itself readily to all zinc solution. Sulphide additions should be predetermined and additions made at consistent and accurate intervals. The loss of Zinc metal through precipitation will be small. When sulphide is used it must have good coverage of the bath, it must not be allowed to concentrate at any one point or a loss of metal will occur at that point. There is bound to be some precipitation of zinc but most will redissolve as the solution is worked. Chemical additions to a highly concentrated bath of this type should be made in a separate additions tank. The solution for dissolving the additions should come from the bath itself. After the additions have

been placed in the additions tank, the sulphide may be added and then the whole addition thoroughly mixed and filtered into the plating bath. The filter will pick up all precipitated and suspended impurities and the bath itself will receive only the purified additions.

Filtration and agitation are very important to accurate plating. For the 64,000 gallons of plating solution in use at Norris, we have installed six 5000 gallon per hour filters. This rate of flow and the method of agitation used gives a complete turn over of plating bath every eight hours. The high pH of the bath demands a filter bag of a material that will withstand constant useage and high caustic content. A good grade of cotton twill seems to be efficient from both an economical standpoint and that of doing a good job. For production work and to obtain the best possible results several filter mediums and combinations were tried, but a combination of Filterbestos and a good powder seemed to be the answer. The "bestos" to be applied first and then the powder. This makes for ease of cleaning and yet gives a maximum of flow and filtration quality.

Length of immersion depends on many things. Thickness of plate, production demanded, etc. An average plating cycle for this set up will take thirty-five minutes, of which sixteen minutes are used for cleaning. Thus in twenty-four minutes of actual plating, we obtain our desired plate.

The ratio of anodes to cathode surface is held at 1.1 and all anodes are replaced and rearranged every twenty-four hours. Regular cast zinc anodes with diagonal hooks for positive contacts are used. Scrap anodes are recast or used via the basket method. Constant supervision of anodes is necessary in order to prevent depletion and to maintain cleanliness of buss bars and anode contacts.

In order to produce a satisfactory plate on the inside of the product, an insoluable anode was devised. This anode

is an integral part of the work holder which carries the material around the conveyor and at the same time provides a positive contact for plating on the inside with the insoluable anode and a negative point contact for the outside. This work holder or plating rack is a Norris development for the job and gives excellent results.

Current for the plating baths totaling 22,500 amps. is derived from generators and rectifiers and distributed to the buss bars through a system of control panels. The consumption of current, as well as materials, is measured and checked through a series of Sagamo Ampere Hour Meters.

After the material is plated, rinsed, and hot air dried, it is given a coat of molten soap, also hot air dried, and started through the remainder of the ironing and drawing operations.

The mechanical operations which follow leave a film of soap and grease on the surface of the metal and must, of necessity, be removed before cronaking. The cronaking operation, by way of explanation, will give a minimum total of 120 hours salt spray resistance to the Zinc plate. The size and shape of the product prohibit manual handling. So, in order to speed up the process and to facilitate the handling, we proposed to pass the work through an automatic machine on an endless conveyor to clean, cronak, rinse and air dry. The cleaning, cronaking and rinsing to be accomplished by sprays. We were told this was not possible and had never before been handled in this manner. A statement of this type is a challenge to the ingenuity of the American mind. Needless to say we not only proposed to handle the work this way, but we actually did it.

We at the Norris Stamping and Mfg. are proud of our contribution towards victory and can point with pardonable pride to the five Army and Navy awards given for continued and distinguished accomplishments in ordinance production.

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CLEANING AND RUST INHIBITING IN ONE OPERATION

with PENNSALT CLEANER EC-10*

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Preparing "blitz cans" for welding presents a tough cleaning problem. Oil and grease must be removed, and the surface must be capable of receiving an even weld without rust from the coolant water used on the welding machine. Penn Salt's technical staff helped this manufacturer of "blitz cans" solve the problem.

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The Charles H. Proctor Endowment Fund

By E. T. CANDEE

Charles Proctor the Founder of the American Electroplaters' Society awarded a prize for the best paper of the Convention for several years prior to his death. It has been the desire of the Executive Committee to perpetuate the name of the Founder of the Society in a suitable manner, and it was considered that an Endowment Fund, properly administered so that the income could be used to continue the annual award for the best paper at the Convention, would be a suitable means of doing this.

The matter was discussed with Mr. Edgar L. Proctor, son of the Founder of the Society, and he has agreed to initiate the Endowment Fund with a substantial sum of the money if the Society can build it up so that there will be adequate income to continue the prize.

The Endowment Fund was announced at the Wednesday afternoon Business Session of the Convention and the Society will be glad to receive contributions to this fund for the above purpose. It is the intention of the Executive Committee to invest these funds in a conservative manner so that the income will at least equal the value of the award which has been made in past years. The Fund will be administered by the Executive Committee and will be kept separate from the general funds of the Society.

We believe that his Endowment Fund the first to be administered by the Society will meet the approval of all the members, and we trust that it will be supported by all those who knew Charles Proctor and who appreciated what he did for the Society.

Contributions to this Fund should be sent to the Executive Secretary, Box 791, Waterbury 88, Conn. as promptly as possible so that we can be sure that the money can be invested and the funds will be adequate to offer the prize award.

Abstracts of Convention Papers

ELECTROPLATING AND THE WAR

By DR. WILLIAM BLUM
National Bureau of Standards, Washington, D. C.

DR. BLUM gave a review of the place of plating in the various phases of war effort and the various substitutions which had been necessitated by shortages of critical materials. The changes fall into two classes, (1) the reduction or elimination of the ordinary plated articles used by civilians in peacetime, and (2) the large scale of electroplating required on different implements of war; the latter had been brought about in general by three different conditions; (a) steel was substituted for non-ferrous alloys because of the shortage of the latter, thus necessitating plating of the steel for corrosion protection, (b) plating of metals to eliminate electrolytic corrosion such as zinc and cadmium plated parts in contact with aluminum, and (c) plating to get specific surface conditions such as silver plating of bearings, or silver and gold plating for parts of electrical conductivity.

Whereas in normal times a large part of plating consisted of nickel and chromium for appearance, today plating consists more of cadmium, zinc, lead, and tin for corrosion resistance, hard chromium plating and silver plating for bearings and other purposes. Of the metals which are plated, cadmium, nickel, and tin are still scarce and put in Group I by the War Production Board. The use of these is restricted carefully to make sure that there is sufficient metal where there is no substitute.

Zinc is being used as a substitute for cadmium, and the several chromate finishes which are available are used extensively to increase the corrosion resistance of zinc coatings.

Tin is being electroplated in large quantities as a substitute for hot tinning of sheet. Indications are that tin will

continue to be scarce after the war and that the elaborate tin plating set up in the steel mill will continue to be used after the war both as a method of conserving tin and because it is economically justified.

It has been found that lead coating of steel offers more protection than might be anticipated from purely theoretical considerations, probably because the corrosion products fill the pores in coating and stop further corrosion. Whereas there was considerable work done on the protection of steel cartridge cases which were substituted for brass, this work has been largely stopped because of the changes in Ordnance needs, thus releasing enough brass for cartridge cases and eliminating the necessity for large scale steel shell case production.

One of the first fatalities of the war was tableware. Many things were tried as a substitute for the nickel silver base used. Unfortunately none of the substitutes were satisfactory. Chromium, silver, zinc, etc. were not satisfactory because of the severe abrasion. There is now ferro chromium available so that they are starting to produce alloy steel tableware which will eliminate this troublesome problem once and for all.

The Government has consistently tried to write specifications for various types of protective coatings so that all Bureaus will ask for a standarized product. This work is bearing fruit and at present there are several specifications issued which are in wide use. Among these are 57-O-2C covering protective finishes for iron and steel parts. AN-P-32, Zinc Plating, and AN-QQ-P-421A, Cadmium Plating.

Dr. Blum's conclusion is that the plating industry has not suffered during the war, in fact they have benefited by being forced to change their type of plating, thereby becoming more versatile and having a chance to prove that plating has a definite place in industry.

THE IRIDITE PROCESS

By ALBERT G. TAYLOR
Rheem Mfg. Co., Baltimore, Md.

THE Iridite Process is a process whereby a chromate coating is put on zinc or cadmium in order to increase its

corrosion resistance. The Iridite Process claims to control the secondary reactives set-up in the chromating process so that a maximum of adhesion and corrosion resistance is obtained.

The coating produced on pure zinc is black and tests have indicated that it will stand 200 to 300 hours salt spray. As in other coatings it has no abrasion resistance and due to the fact that it is a gel—it is destroyed by high temperatures. In applying the coating there is from .00002 to .00004″ of metal removed, partially replaced by the coating, thus not enough metal is removed to change dimensions or seriously reduce the thickness of metal coating. The Iridite solutions are so made up that they can be mixed on the spot. Standard plating room technique of cleaning, dipping, and drying off afterwards can be used. Although the coating can be applied to die castings and hot galvanized coatings, slight modifications are required to obtain good black coatings. Alloys such as die castings and sand castings do not acquire the jet black color which is obtained from Iridite processes applied to pure zinc.

RAPID DETERMINATION OF COPPER IN NICKEL PLATING BATHS

By B. B. KNAPP

The International Nickel Company, Inc. Research Laboratory, Bayonne, N. J.

THE author has made use of a laboratory reagent which has been known for some time as Dithizone or chemically as diphenylthiocarbazone. The dithizone reacts with the metal, in this case copper, under controlled conditions forming a copper organic compound which can be extracted with carbon tetrachloride. The carbon tetrachloride solution of the copper dithizone mixture can be separated and then the determinations made either gravimetrically or volumetrically. However, since the copper dithizone acquires a dark red color whereas the dithizone in carbon tetrachloride alone has a green color, by proper technique the relation between the red and green makes it possible to set up color standards determining the copper content by a colorimetric method. This furnishes a rapid method of checking copper in such baths as nickel and cobalt.

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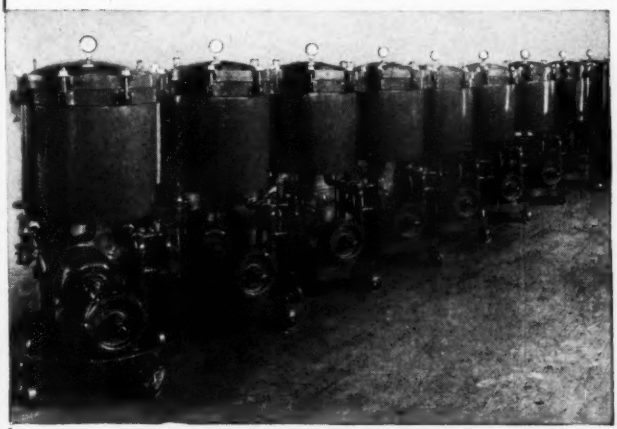

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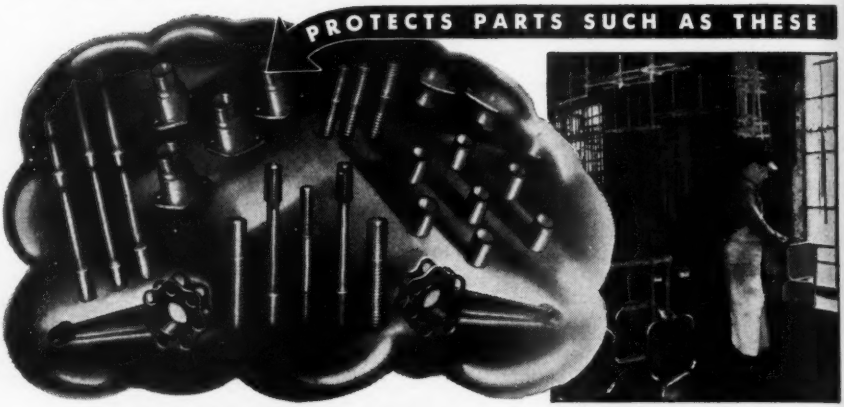

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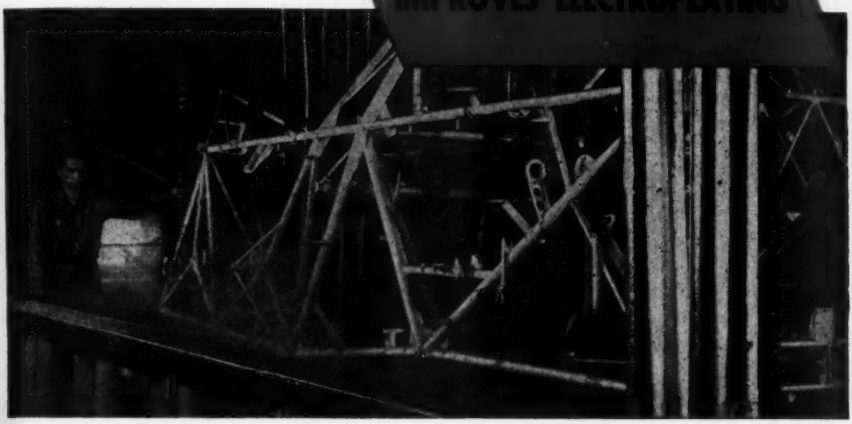

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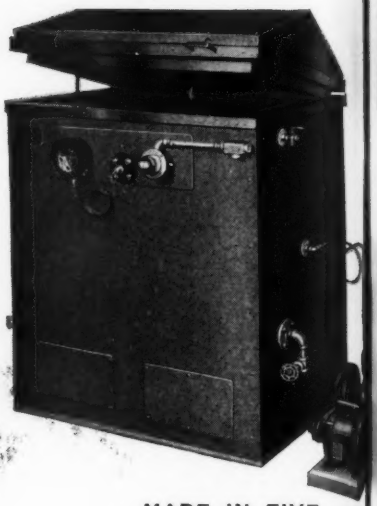

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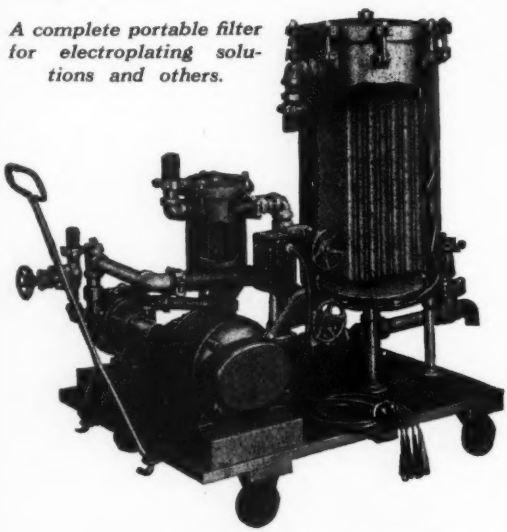

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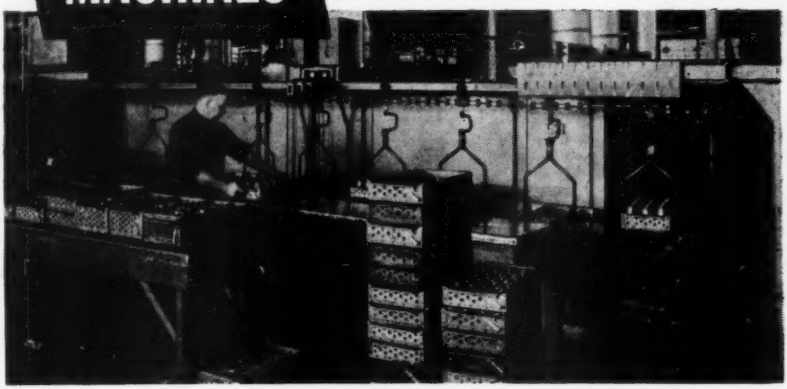

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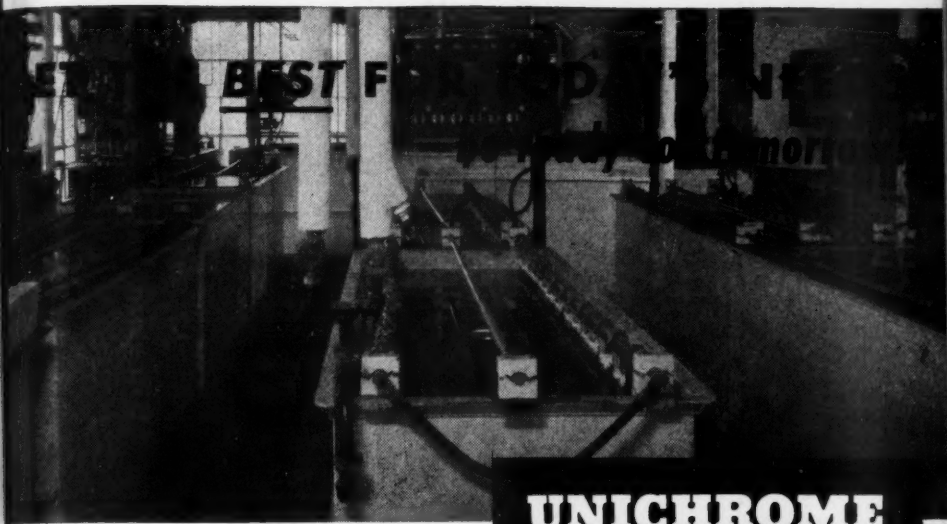

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The Fundamentals of Chemistry for Electroplaters

Part IX. Oxidation and Reduction

By SAMUEL GLASSTONE, D.Sc., Ph.D.

CUPROUS AND CUPRIC COMPOUNDS

AT the end of Part VIII (*Monthly Review*, June 1944) it was stated that certain elements have more than one valence. Consider, for example, the metal copper; this element forms two compounds with chlorine and their formulas have been shown to be CuCl and $CuCl_2$, respectively. (The symbol for copper is Cu, while that for chlorine is Cl.) The valence of chlorine is unity, and hence in accordance with the information given in the preceding article, it follows that copper has a valence of one in the compound CuCl, and two in the compound $CuCl_2$. Similarly, copper forms two oxides, that is, compounds with oxygen, namely Cu_2O and CuO. Since oxygen has a valence of two, it can be seen that the valence of copper is one in the first of these oxides, and two in the second. In fact, an examination of all compounds formed by the element copper shows that they fall into two categories, in which the valence is either one or two. In order to distinguish between these two sets of substances the former are called "cuprous" compounds and the latter are "cupric" compounds. Thus, CuCl is cuprous chloride, Cu_2O is cuprous oxide, while $CuCl_2$ and CuO are cupric chloride and cupric oxide, respectively.

FERROUS AND FERRIC COMPOUNDS

The metal iron also forms two well known series of compounds, in which the element has different valences; these are now two and three. For example, there are two chlorides of iron with the formulas $FeCl_2$ and $FeCl_3$, respectively; in the former the valence of the iron atom (Fe) is two, while in the latter it is three. The corresponding oxides are FeO and Fe_2O_3; the valence number of oxygen is two, and so an application of the valence rule given in Part VIII shows that the valence of iron is two in FeO and three in Fe_2O_3. The compounds of iron in which the element has the lower valence number (two) are referred to as "ferrous" compounds, whereas those with the higher valence (three) are known as the "ferric" compounds. Thus, $FeCl_2$ and FeO are ferrous chloride and ferrous oxide, while $FeCl_3$ and Fe_2O_3 are ferric chloride and ferric oxide, respectively.

HIGHER AND LOWER VALENCE COMPOUNDS

In general, whenever a metal forms two series of compounds in which it has different valence numbers, those in which the valence has the lower value are given a name ending in "ous;" on the other hand, the name for those with the higher valence ends with "ic." In addition to the familiar elements copper and iron, just mentioned, reference may be made to the metal chromium. This actually forms at least three series of compounds, but it is in only two of these that the element exhibits its essentially metallic properties. These two series are referred to as "chromous," e.g., $CrCl_2$, CrO and $CrSO_4$, in which the valence of the chromium atom is two, and the "chromic" compounds, e.g., $CrCl_3$, Cr_2O_3 and $Cr_2(SO_4)_3$, with a chromium valence of three.

VALENCE STATES OF TIN

Among other elements of interest to the electroplater which possess more than one valence number, mention may be made of tin; this can have a valence of two or four. In the "stannous" compounds, e.g., $SnCl_2$, the valence is two, while in the "stannic" compounds, e.g., $SnCl_4$, the value is four. (The symbol for the element tin is Sn.) It is of interest to call attention to the fact that there are other compounds of tin in which the element has a valence of two and four; these are called "stannites" and "stannates," respectively. In these compounds, however, the tin is not behaving strictly as a metallic element. For compounds of nonmetallic elements the states of lower and higher valence are distinguished by the endings "ite" and ate," respectively. There are, for instance, sulfite and sulfate, nitrite and nitrate, for the true nonmetals, sulfur and nitrogen, in addition to stannite and stannate, chromite and chromate, for tin and chromium, respectively, which are usually metallic in character. The difference between metallic and nonmetallic behavior will be considered in a later article.

MORE STABLE COMPOUNDS

When a metal forms two (or more) series of compounds of different valence, one or other series is usually more stable, and hence better known, under ordinary conditions. With copper, for example, the cupric compounds (valence two) are the most familiar. Thus, ordinary copper sulfate is really cupric sulfate, $CuSO_4$. There is a cuprous sulfate, Cu_2SO_4, but it is difficult to obtain and it is not stable. The same is more or less true of other copper compounds, such as the nitrates, chlorides and oxides; in each case the cupric form is the more familiar. However, when it comes to the cyanide it is found that the reverse is true; for some reason, not clearly understood, the cupric cyanide $Cu(CN)_2$ is not stable, but cuprous cyanide CuCN is quite stable. The well-known copper cyanide (alkaline) plating bath

is based on cuprous cyanide, in which the valence of the copper is unity. The acid copper bath, on the other hand, involves copper (cupric) sulfate in which the element has a valence number of two. The difference in the valence of copper in these two solutions is of importance in electroplating, because it means that the same quantity of electricity will cause twice as much copper to plate out from a cyanide (alkaline) bath as from a sulfate (acid) bath. (See the Fundamentals of Electrochemistry and Electrodeposition, Chapters V and VI.)

OXIDIZED AND REDUCED STATES

It is a common practice to distinguish between the "ic" and "ous" series of compounds by referring to them as "oxidized" and "reduced" states, respectively. It is desirable, for many purposes, to understand the significance of these important terms. The word "oxidation" was originally used to describe the addition of oxygen (or removal of hydrogen) from a substance. For example, the element copper is oxidized by oxygen to from cuprous oxide Cu_2O, which can be further oxidized to cupric oxide CuO; thus,

$$2Cu + O = Cu_2O \text{ and } Cu_2O + O = 2CuO.$$

The term "reduction" was regarded as the reverse of oxidation; that is, it represents the removal of oxygen (or the addition of hydrogen). Thus, cupric oxide (CuO) might be reduced to cuprous oxide (Cu_2O), and then to metallic copper (Cu). It is seen therefore that cuprous oxide may be *oxidized* to cupric oxide, while cupric oxide, on the other hand, can be reduced to cuprous oxide; thus, the cupric form may be regarded as the oxidized stage, and the cuprous as the reduced stage of the copper oxides. Since all cupric (valence two) compounds are related to cupric oxide, while cuprous compounds are related to cuprous oxide, it can be understood why the former are referred to as "oxidized" and the latter as "reduced."

OXIDATION AND REDUCTION

The general rule is that the compounds corresponding to the element when it has its higher valence, e.g., cupric, ferric, stannic, stannates and chromic compounds, are referred to as the oxidized state, while the compounds of the lower valence form, e.g., cuprous, ferrous, stannous, stannite and chromous, are known as the reduced state. In accordance with this rule the term "oxidation" is extended so as to include not only the addition of oxygen, but also *any process which a metal increases its valence.* Similarly, "reduction" covers all cases in which there is a decrease of valence of a metal. A substance which is capable of bringing about oxidation is called an "oxidizing agent," while one which can cause reduction to occur is referred to as a "reducing agent." An oxidizing agent must be a substance that

is itself readily reduced, while a reducing agent, similarly, must be capable of being easily oxidized. Oxygen itself, and many highly oxidized compounds, such as nitrates, chlorates and certain oxides, are oxidizing agents. Chlorine is also an important oxidizing agent, for although it contains no oxygen, it can readily oxidize many compounds from the "ous" to the corresponding "ic" stages, e.g., ferrous to ferric, stannous to stannic. Among the reducing agents, mention may be made of hydrogen itself and of some hydrogenated compounds, but more important are substances which involve the reduced (low valence) states of many elements. Stannous compounds and stannites, for instance, are powerful reducing agents. In these substances the valence of the element tin is two, but the preference for a valence of four is so great that the stannous compounds are easily oxidized to the stannic state. As a result they are able to reduce other substances, e.g., ferric salts, from the higher to the lower valence state; thus,

$$2FeCl_3 + SnCl_2 = 2FeCl_2 + SnCl_4.$$

It is seen that the stannous chloride ($SnCl_2$) has reduced the ferric chloride ($FeCl_3$) to the ferrous state ($FeCl_2$); at the same time, however, the stannous chloride has been oxidized to the stannic form ($SnCl_4$). This is an illustration of the reciprocal relationship that always occurs in oxidation and reduction reactions; the reducing agent is oxidized, while the oxidized form is reduced, and vice versa.

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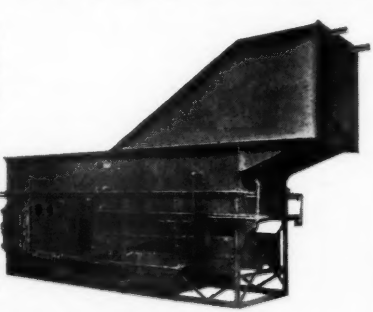

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Chemical Resistance—Excellent for all plating cycles.

Toughness—Withstands repeated flexing and shop handling—cuts cleanly and easily at contacts.

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TENACIOUS as a terrier at the toughest metal cleaning and degreasing jobs are Wyandotte Metal Cleaners.

For heavy duty or light, there's a specialized Wyandotte Metal Cleaner for every purpose. And they're all specialists at smoothing out kinks in the war-busy production line.

In munitions making, airplane manufacturing, and in scores of other industries, Wyandotte products are saving time and labor in turning out war weapons for our fighting men.

Quick, sure and thorough, Wyandotte Metal Cleaners are insurance that metal surfaces, no matter how fouled in the last process, will be right for the next. Because they're *safe on any surface*, you save on rejects, too.

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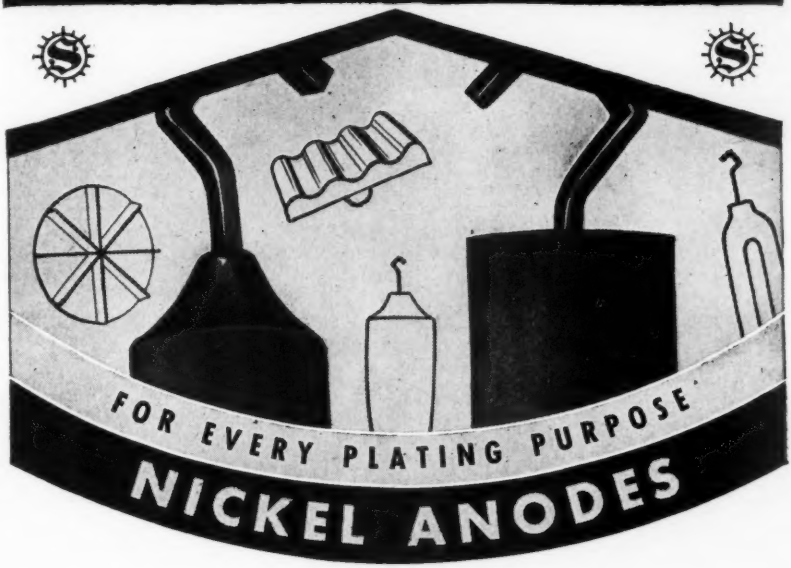

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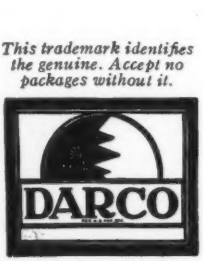

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TYGON TEMPRO-TEC is a liquid form of Tygon, the rubber-like material used to line pickle, plating and acid tanks. As a masking or stop-off lacquer Tygon Tempro-tec is applied, like paint, by spray gun or brush. Dries within a few minutes. Peels easily free, usually in one piece. Ideal for hard chrome work. Possesses high dielectric strength; does not "wet" easily, lessens dragout; will not take a plate; workable temperature range up to 175° F. Available in white, black, clear, and in transparent and opaque colors. One gallon covers 250 square feet. Priced at $5.30 per gallon in 5 gallon lots for the clear. Colors slightly higher.

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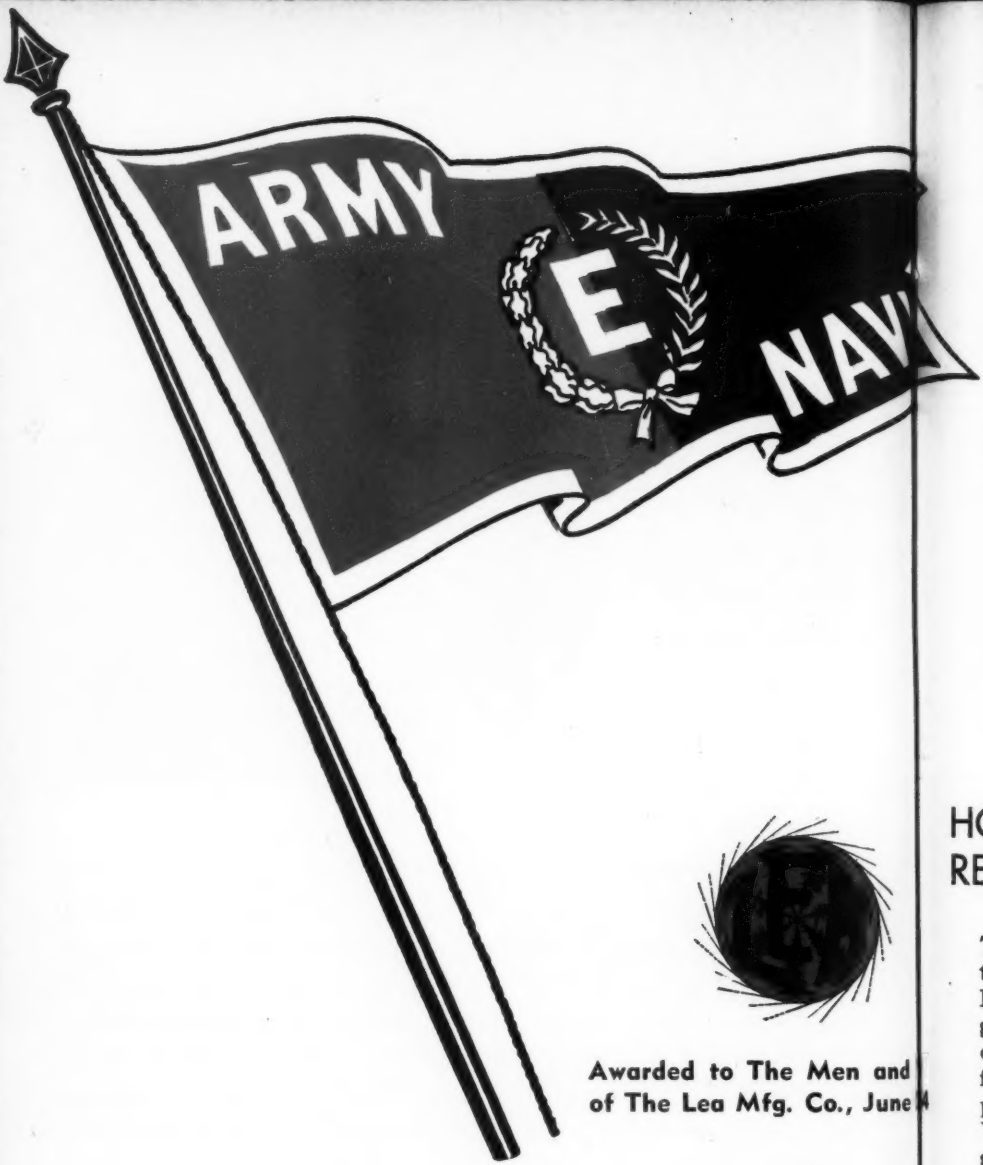

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The Army and Navy "E" Award is a tribute to workers . . . a tribute to those who plan, design and produce . . . and rightly so! We here at Lea are deeply honored by the recognition accorded us by the two great Services. But in a sense, this award more than encompasses just our plant and our employees. It is recognition of the vital part Lea finishing operations and Lea compositions play in the gigantic task of producing implements of war.

Yes, we at Lea are mighty proud of the "E" Pennant that will now grace our plant. But we are deeply conscious of the fact that it imposes a great responsibility. More keenly than ever do we all realize that the fruits of our efforts here are needed for the vast war production being carried on by American Industry.

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INDUSTRY NEWS

SOLVENTS RECOVERY SERVICE, INC. OPEN NEW PLANT

Solvents Recovery Service, Inc. 1019 Broad Street, Newark, New Jersey announce the opening of their third plant in Thomaston, Conn., in order to better care for the large volume of business that they are receiving from New England Industrial plants.

The plant will be located in a portion of the building formerly occupied by the Seth Thomas Clock Co. Careful consideration has been given to allow for expansion of the plant in the post war period to take care of various types of solvent and lacquer thinners that will come in to use again for decorative finishing.

All solvents recovered at the Thomaston plant will be by the Lofgren Process which is in use at the company's other two plants. For the present the Connecticut plant will specialize in the recovery of Trichlorethylene from the sludge drawn from degreasing machines as well as other types of chlorinated solvents. The plant will also handle hydrocarbon type solvents as well as some of the higher boiling esters.

Al Crane who has represented the Solvents Recovery Service Inc. for the past four years will continue in that capacity and will also supervise operations at the new plant.

HIERMEIER NAMED INDUSTRIAL MANAGER

V. H. Hiermeier has been named industrial manager of the St. Louis office of the Brown Instrument Co., Philadelphia precision industrial instrument division of Minneapolis-Honeywell Regulator Co.

Mr. Hiermeier, who succeeds I. K. Farley, has had 15 years' experience in the industrial instrument field. For the past few years he has been with the Brown Company in its Chicago office. Mr. Hiermeier is credited with doing much to help Purdue University establish and operate an instrumentation course.

HELP WANTED

Resin Chemist capable of formulating, for industrial protective coatings use, alkyd resins.

This man must have had previous experience in this type of work, and must be capable of initiating new formulations, and must have ideas relative to the relation of resins formulated to industrial use.

Salary Range
$300.-350. monthly

Senior Chemist to formulate industrial protective coatings.

This man must be thoroughly familiar with the industry requirements, must have a wide knowledge of cellulose and resinous materials entering into such coatings, and must be capable of initiating new formulations.

Previous experience in the protective coatings field is necessary.

Salary Range
$250.-300. monthly

Man capable of formulating wood finishing materials, particularly all types of wood stains and wood fillers.

This is very specialized type of knowledge and does not necessarily require formal chemical training. However, it is necessary that this man have broad experience in the formulation and use of wood finishing materials.

Salary Range
$225.-275. monthly

Two Laboratory Assistants, male or female. Previous industrial training necessary, but such training must not necessarily be in the protective coatings field.

Former chemical training desirable, but not mandatory.

These people are to act as assistants to senior chemists, and eventually qualify as senior chemists.

Salary Range
$150.-200. monthly

Three Laboratory Assistants, male or female. No previous industrial experience necessary. Formal chemical training desirable, but not mandatory.

These people would act as general laboratory assistants, doing specified or routine work.

Salary Range
$100.-150. monthly

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KEARNEY AND FALER ADVANCED

W. I. Tebo, Chief Engineer of Detrex Corporation, Detroit, manufacturers of metal cleaning equipment, chemical cleaning compounds, oil-extraction plants and dry cleaning machinery, has announced two appointments in the Engineering Department of the firm.

Thomas J. Kearney, formerly technical advisor to the Director of Sales. has been promoted to Assistant Chief Engineer in charge of Industrial Equipment Design and Detailing. Mr. Kearney has been associated with the company for ten years and has wide experience in sales, service, production and engineering capacities. In addition to supervision of the drafting department and the general development of Detrex industrial cleaning equipment (degreasers and washers), Mr. Kearney will have charge of machine design in the preparation of customer quotations.

John A. Faler, Assistant Chief Engineer of the company has been appointed to take charge of Extraction Equipment Development. Detrex Corporation has developed complete equipment for the extraction of oil from soybeans by the use of a non-flammable solvent. Mr. Faler will coordinate new design and equipment development work in this division.

JEFFRIES TRUSTEE OF BATTELLE

Dr. Zay Jeffries, noted scientist and a pioneer in tungsten metallurgy and in the development of high-strength aluminum alloys, has been elected to the board of trustees of Battelle Institute, industrial research organization here, it was announced today.

Dr. Jeffries is technical director of the Lamp Department of General Electric Company, Cleveland, Ohio; chairman, Carboloy Company, Inc.; and vice-chairman of the War Metallurgy Committee of the National Academy of Sciences and National Research Council.

J. J. SCHAEFER JOINS WYANDOTTE

Wyandotte Chemicals Corporation has recently announced the formation of their new Development Department which will be headed by J. J. Schaefer.

About five years ago Wyandotte Chemicals Corporation embarked on an organic research program and the development of both organic and inorganic products will now be handled by this new department.

Mr. Schaefer is a graduate of the University of Dayton and the Massachusetts Institute of Technology. He was a member of the technical staff of Niacet Chemicals Corporation of Niagara Falls from 1928 to 1934. In 1934 he became Director of Research for Sharples Chemicals Incorporated and was a Vice-President of that Company from 1936 until his recent resignation.

Mr. Schaefer is a member of the American Chemical Society, the American Institute of Chemical Engineers, and of the Chemists Club of New York.

OBITUARY
CYCRIL COCHRANE LEVY

Mr. C. C. Levy Industry Engineer, Metal Working Section, Westinghouse Electric and Manufacturing Company, East Pittsburgh, died suddenly at his home in Wilkinsburg, Pa. on June 5, 1944.

Mr. Levy was born in Jamaica, British West Indies, he took his preparatory course at Jamaica College and studied Electrical Engineering at Toronto University, Canada. He joined Westinghouse in 1913 as a draftsman. Two years later he was made a design engineer on automatic substation equipment.

In 1930 he was transferred to Industry Engineering Department where he handled the application of electrical apparatus in the Electro-Chemical Industry. During this period he assisted in the development of electronic equipment to clean gases and assisted in the selection of electrical apparatus for large electrolytic installations.

In 1941 he was transferred to the Metal Working Section of Industry Engineering where he had charge of the application work on the newly developing field of high frequency equipment and the rapidly expanding program of electric furnace installations.

Mr. Levy sponsored the application of specially designed air circuit breakers for electric arc furnace applications, and more recently guided the development of both the electronic and Rototrol regulators for electric arc furnaces. He made a number of valuable contributions in this field.

Mr. Levy was Chairman of the Committee on Electrochemistry and Electrometalurgy of the American Institute of Electrical Engineers at the time of his death. He has just completed a program for the Summer Session to be held in St. Louis this year. He was also Vice-Chairman of the Electrothermal Division of the Electro-chemical Society. At the time of his death he was assisting in arranging a program for one of the sessions of the National Meeting to be held in Niagara Falls in October. He gave considerable time to work in National Societies and was a frequent contributor of technical papers.

DIVINE EXPANDS

B. D. Divine, President of Divine Brothers Company, buffing wheels, casters and industrial truck wheels, and machinery manufacturers of this city, officially confirmed the report that Divine Brothers Company had purchased the property of the former Sauquoit Paper Company at 200 Seward Avenue, Utica. Possession will be given July 1st, but complete removal from 102 Whitesboro Street will not be effected for several months.

The move is a result of natural expansion and was not influenced by war contracts. This new location will double the present square footage of floor space. It is ideally suited to heavy manufacturing operations and has double spur tracks on two railroads.

The Seward Avenue plant is adjacent to the Divine Brothers Company machinery manufacturing plant, the Munson Mill Machinery Company. The total acreage of property is over 13; the total floor space of the two plants about 150,000 square feet.

DURNEY TO SULPHUR PRODUCTS

Sulphur Products Company, Inc. of Greensburgh, Pa., announce the appointment of Mr. Lawrence J. Durney as chief chemist. For the past two years Mr. Durney was associated with Remington Rand Inc., Propellor division, as plant chemist and foreman plater. In this capacity he did considerable work on the problems involved in the stripping of copper from steel gears after carburizing. Problems also included metal cleaning centering around precision machining and plating. Exact control of all chemical operations was required.

As chief chemist for Sulphur Products, Mr. Durney's main responsibility will be the development of applications for liquid sulphur as a copper stripping agent, to replace certain more critical, less available, chemicals now in use in many war plants.

Mr. Durney is a graduate of Manhattan College, New York, where he received a degree of B.S. During his undergraduate days he was a laboratory instructor in Physics and served as a substitute instructor in mathematics.

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CLEAR LACQUER for steel . . silver . . gold . . brass . . copper . . nickel and other metals . . .	**NON-STAIN SPOT LACQUERS** especially developed for protecting coatings of copper . . brass . . silver . . .	**WATER-DIP No. 33** for iron, aluminum, cadmium - plated and other production plated parts . . eliminates fingerprints and staining during assembly.
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Another MANDERSCHEID Product

Use your own polishing lathe spindle as a screw press. See line drawing.

A polishing wheel equipped with a PRESTO BUSHING has these advantages:

Wheel is not forced over spindle; saves spindle wear.

Machine is idle when wheels are changed — no risk to operator.

Wheel always concentric — no chatter. Runs true with an even wearing down of emery on face, therefore does a better job with no waste of grain.

PRESTO BUSHINGS may easily be pressed into the wheels you now have or can be put in NEW WHEELS by your polishing wheel manufacturer.

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Samples on request. Just specify size spindle on which polishing wheel will be used.

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FOR RAPID, consistent production of stop-off deposits on steel parts which are to be selectively hardened, consider what Du Pont High Speed Copper Plating offers.

HIGH SPEED—In 10 to 15 minutes smooth, impervious and uniform deposits of 0.001" or more in normal commercial operation . . . plating at 40 to 80 AS/F—equivalent to 80 to 160 AS/F for the usual bivalent solution.

LOW COST—Drag-out recovery is practical and lends to economical operation. At the high operating temperatures, water evaporates from the solution and may be replaced by rinse water, thus returning drag-out to the plating tank.

STABILITY—Solutions do not decompose over long periods of time, in operation or when idle. *No poisonous or objectionable fumes are evolved.*

LOW METAL CONCENTRATION—For normal speed of operation, low concentration Potassium (RH-661) baths may be used. Drag-out loss is low, rinsing is easy and solutions are easily filtered.

Du Pont High Speed Copper Plating Solutions are ideal for large-scale commercial operations. Since introduction, over 10,000,000 lbs. of copper have been plated from these high speed copper baths. Du Pont Technical Service has had many years of experience with the installation and operation of plating solutions and will be glad to help in the development and installation of a suitable plating process to meet specific requirements. Just call or write our nearest district office. E. I. du Pont de Nemours & Co. (Inc.), Electroplating Division, Wilmington 98, Delaware.

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For electrolytic cleaning of ferrous metals prior to cadmium, zinc, tin, copper, nickel and chromium

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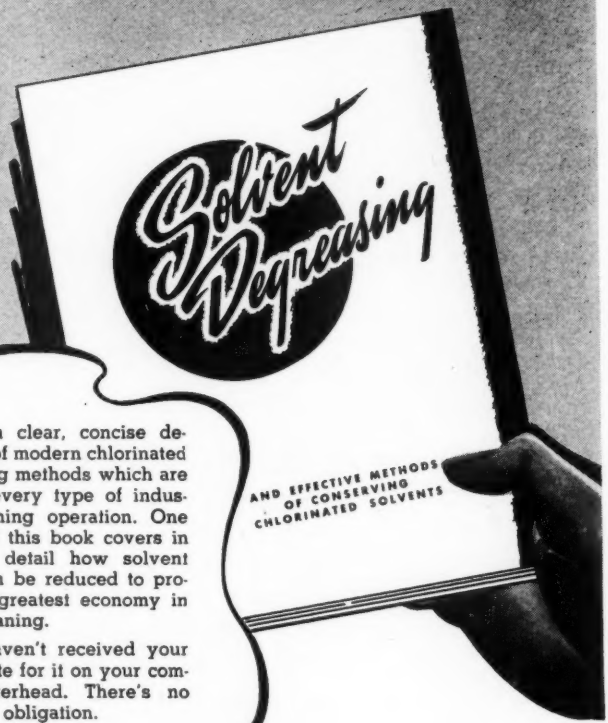

Here is a clear, concise description of modern chlorinated degreasing methods which are used in every type of industrial cleaning operation. One section of this book covers in complete detail how solvent losses can be reduced to provide the greatest economy in metal cleaning.

If you haven't received your copy, write for it on your company letterhead. There's no charge or obligation.

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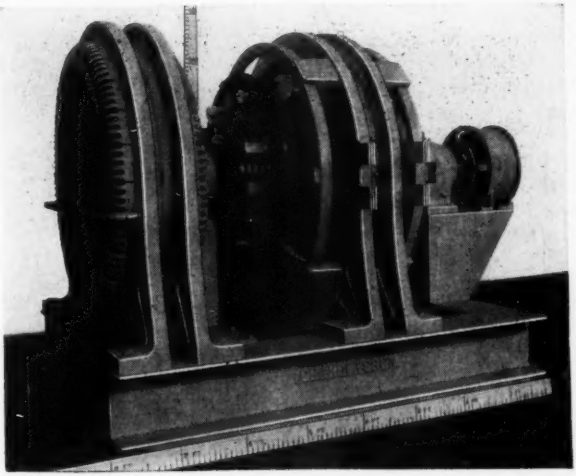
WAR BONDS—TODAY'S BEST INVESTMENT

CHANDEYSSON GENERATORS ARE BACK ON A FURLOUGH



For more than two years the war demands of informed and discerning buyers made it very difficult to secure Chandeysson motor-generator sets for electroplating and anodizing without long delay.

Tooling-up has now decreased to an extent which permits delivery of Chandeysson equipment almost as quickly as could be accomplished in peace times.

We now have in stock (subject to prior sale) 7500 ampere, 12 volt sets and 5000 ampere, 6 volt sets. Other sizes can be manufactured in reasonable time.

Chandeysson Electric Co.

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THE ABSTRACT SECTION

MAURICE R. CALDWELL

Chairman Program and Educational Committee

Electrochemistry in the Post-War World. By R. M. BURNS. Electrochemical Society—Preprint 85-23 for meeting of April 14, 1944, p. 1-6.

Industrial electrochemistry has been indispensable in the mechanization of war and it will be essential in the expanding economy necessary to post-war prosperity. Alloy steels, aluminum, magnesium, abrasives, alkali, chlorine, synthetic organic chemicals derived from calcium carbide, chromium plating, and hundreds of other products of electrothermic and electrolytic processes are the raw materials of war machines as they are the source of much of the equipment of every-day life. In the post-war world electrochemistry should create new products and new industries, and by process improvement and increased efficiency should reduce the cost of existing products and insure their wider distribution. These developments should mean high production, wide employment, a large national income, and thus a higher standard of living. To make this contribution to the future economy the electrochemical industry will require abundant and reasonably priced electric power to operate processes, research to develop new things, trained engineers to direct technology, and an intelligent and sympathetic governmental attitude toward private enterprise. It is with these matters that this discussion will be concerned.

FRANK K. SAVAGE, VINCENT MATTACOTTI

Iron Plating. By W. B. STODDARD, JR. Electrochemical Society—Preprint 84-5 for meeting Oct. 13-16, 1943, p. 37-45.

Improved chloride iron plating solution described; grain size is controlled by addition to solution of relatively small amounts of manganese chloride; pitting is eliminated by use of proper wetting agent; temperature and pH ranges are widened for production of good deposits by use of manganese addition; current efficiency is more than 95% in uncontaminated solutions; physical properties of plate. Spanish resume included.

V. MATTACOTTI, FRANK K. SAVAGE

Novelties in Electroplating. By O. P. WATTS. Electrochemical Society—Preprint 84-9 for meeting Oct. 13-16, 1943, p. 75-8.

Report covers three investigations: brilliant multicolored electroplates obtained from ammonium molybdate solutions; study of codeposition of nickel and copper led to development of citrate cyanide bath; bright hard alloy deposit contained from 60 to 80% nickel, balance copper, depending upon plating conditions which are specified; attempts to codeposit chromium with either copper or iron were unsuccessful.

V. MATTACOTTI, FRANK K. SAVAGE

Study of Deposition Potentials and Microstructures of Electrodeposited Nickel Zinc Alloys. By B. LUSTMAN. Electrochemical Society—Preprint 84-6 for meeting Oct. 13-16, 1943, p. 47-59.

Potentials and composition of electroplates deposited from bath containing chlorides of zinc and nickel measured; temperatures and microstructures of electroplates determined; changes in potentials at critical current densities correlated with equilibrium phase diagram of nickel-zinc alloys; microstructures of alloy electroplates examined with respect to surface characteristics, phase distribution, and banding.

V. MATTACOTTI, FRANK K. SAVAGE

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MEAKER Full Automatic Machines are most flexible, and can be readily adapted to handle different size racks through an entirely new sequence. Transfer mechanism may be moved or made wider, or "lift" increased at a nominal expense. Unit may be lengthened by adding new sections, without junking any considerable part of the old machine.

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MULTI-PLATER

GREEN MULTI-PLATER MODEL 86

ALL IN ONE CABINET—

the MULTI-PLATER provides eight (8) separate selenium rectifier sections each having an output capacity of 6 volts 500 amperes.

For quick, simple installation and mobility, MULTI-PLATERS are mounted on casters.

Separate output terminals make it possible to connect each rectifier section to a separate tank, or several sections may be added together for higher voltage or greater current capacity, or *all* the sections may be grouped together in a single bank.

When sections are used individually, or in groups, there are *several hundred* possible combinations; for example: If all eight sections are interconnected any one of the following outputs may be obtained:

6 volts 4000 amperes,
or 12 volts 2000 amperes,
or 24 volts 1000 amperes,
or 48 volts 500 amperes.

Standard MULTI-PLATERS provide internal connections for operation from 220, or 440 volt 60 cycle 3 phase supply.

MULTI-PLATERS can be furnished for other supply voltages.

MULTI-PLATERS of lesser capacity than Model 86, as illustrated, are also available.

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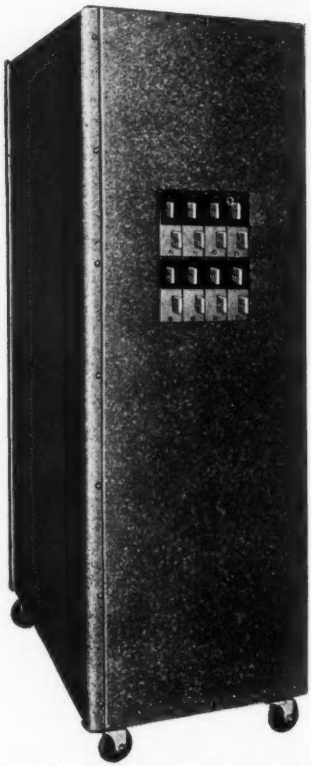

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W. GREEN ELECTRIC COMPANY, INC.

GREEN EXCHANGE BLDG., 130 CEDAR ST., NEW YORK 6, N. Y.

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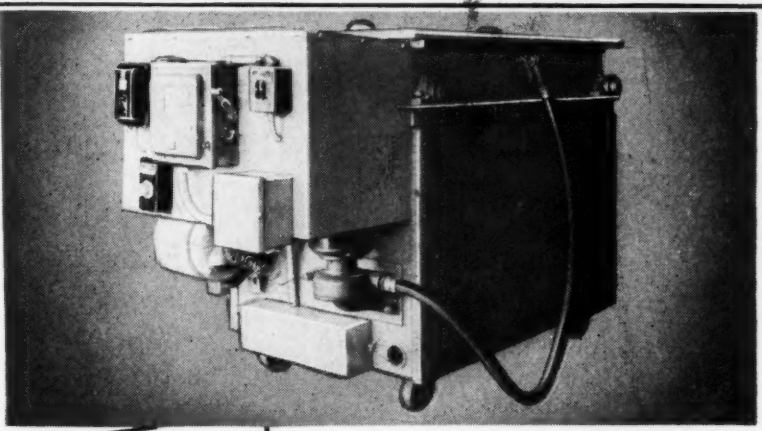

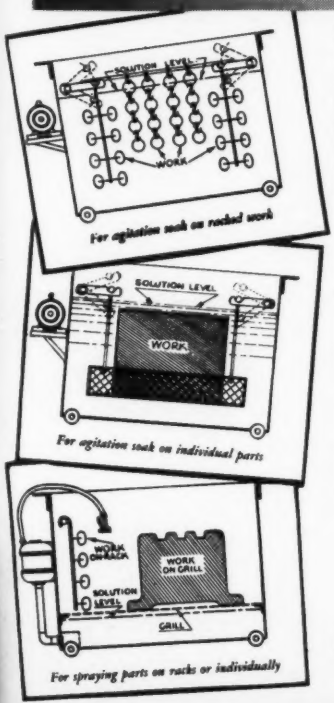

This new Magnus machine is versatile as well as super-speedy. It can be used to soak (plus a unique method of agitation that cuts cleaning time by large margins)—to spray—or to soak and spray in any required sequence. There's a size of machine that can be set up to handle your cleaning operations far better than anything you have used so far.

Any Metal—Any Object —Any Cleaner

The machine can be used with any cleaner—petroleum spirits—alkaline cleaners—chlorinated solvents or Magnus Emulso-Dip solutions. It is adaptable to any metal and any size of work. Where required, multiple units can be used to provide for any combination of precleaning washing and rinsing. You can get physically clean or chemically clean work, as the situation demands.

Prices range from $300 to $800, depending on capacity and heating method.

Write for Bulletin 3600, which covers the principle, range of capacities and full details on applications.

MAGNUS CHEMICAL COMPANY
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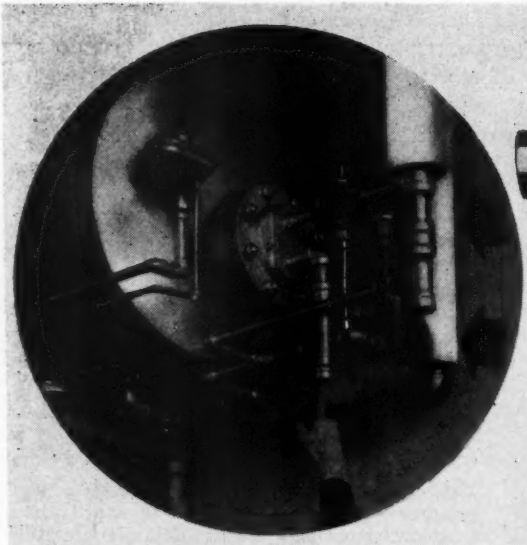
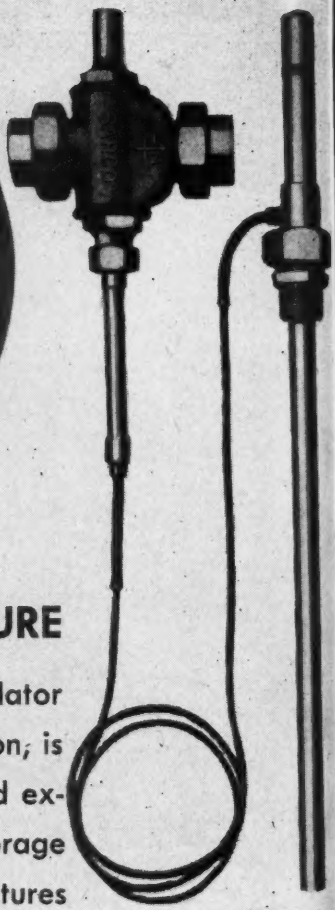
Magnus CLEANERS·METHODS·MACHINES





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The Sarco TR-21 temperature regulator is self-actuated by liquid expansion; is packless and easy to install. Used extensively for steam heated storage tanks and process work. Temperatures 0° to 400° F., pressures to 175 lbs. Ask for Catalog No. 600.

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● Removes oil, grease, smut, grime, drawing and buffing compounds on all metals. LIXOL produces no chemical attack on sensitive metals. Protects metal against rust and tarnish, leaves surfaces ready for painting. Small parts are dipped in LIXOL at room temperature and rinsed with either cold pressure rinse or hot still rinse. LIXOL can be sprayed or brushed on large parts, rinsed with pressure spray. Adaptable to simple equipment. No fumes or objectionable odor and harmless to hands. Immediate delivery. Send for suggestions as to application of LIXOL to your particular problem.

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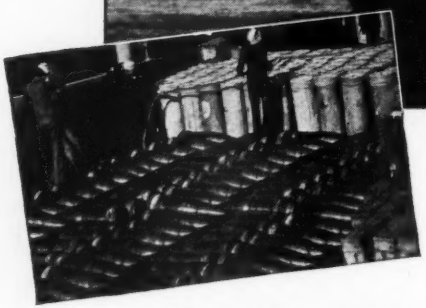

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"Spec" Primers

No. AXS-946 **No. 3-183**

For Steel Shells, Bombs, Cartridge Cases

Here are two specification finishes with the usual Egyptian plus. They meet every requirement from Uncle Sam's standpoint and every requirement which you set as to speed, ease of application, drying and appearance.

Apply to bare metal by spray, brush or dip. Sprayed on, they air-dry in 10 minutes for handling and top coating with enamel. If desired they can be baked 10 minutes at 250 degrees F.

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EGYPTIAN FINISHES

EGYPTIAN
SUPERIOR FINISHES

ARMY-NAVY "E" AWARDED TO LEA MFG. CO.

Tuesday, June 27th, a ceremony was held in Waterbury by the Army and Navy to award the "E" to the employees of that company. The company, their friends, and Waterbury in general was proud that a company of only fifty employees was given this award.

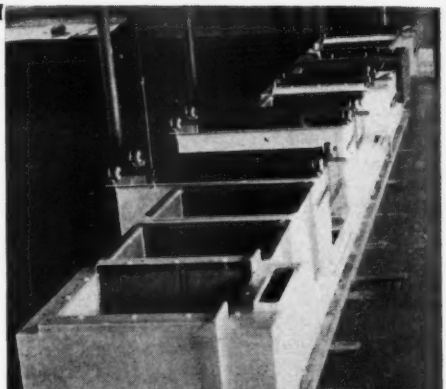
Attending the ceremonies were six Army Officers, a Color Guard of the American Legion, and the employees of the company with their friends. The Master of Ceremonies was John S. Monagan, Mayor of Waterbury, who welcomed the assemblage for the City of Waterbury. The Presentation Address was given by Major A. H. Murtha, and the pins were presented to the employee representatives by Lt. Raymond Smith, USNR.

The award was accepted on behalf of the management by the President, Robert S. Leather, and the pins were accepted on behalf of the employees by Mr. Ernest Martin.

The ceremony was followed by a buffet supper. Music before and after the ceremony was given by the Fulton Band of Waterbury.

BUY WAR BONDS

Fabricated to a Quality Pattern

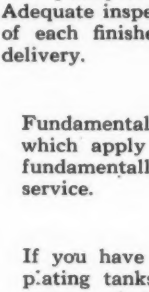


Service records of many thousands of Storts-welded plating tanks have convinced us that tank buyers profit when they invest in tanks that have been built under this four-point control:

1. Specification of plate material that is suitable for the job.
2. A welding procedure that has been proved to be capable of producing sound, dependable welds.
3. Weldmen who have proved their qualification for making first quality welds.
4. Adequate inspection and test of each finished job before delivery.

Fundamentally, this control is about all you will find in the codes which apply to the welding of boilers and pressure vessels. And fundamentally the purpose is the same—to prevent failures in service.

If you have not already become acquainted with Storts quality in plating tanks and accessory equipment, let's get together on your next requirement.



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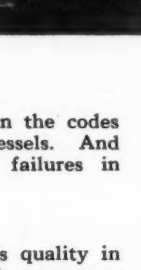

Manufacturers of Welded Fabrications to Specification

BRANCH NEWS

Business and Social News • Educational Activities

PHILADELPHIA BRANCH

President Verrell called the meeting to order with about 37 present.

The minutes of the previous meeting were approved as read.

The applications of Wm. F. Mershon, active, John Fusselman, associate, and Francis J. Harold, associate, were referred to the Board of Managers.

After approval by the Board of Managers, Herbert E. Ricks, associate, and Louis Sherman, active, were elected to membership.

Past Supreme President George Gehling installed the following elected officers: President Eugene J. Zurbach, Jr., 1st Vice-President Henry G. Orlik, 2nd Vice-President Leonard T. Burden, Secretary Paul Mentzer Sr., Treasurer George M. Long, Librarian Albert Hirsch, and the Board of Managers, George Gehling (by proxy), Joseph E. Underwood (by proxy), and Nat Verrell.

Librarian Al Hirsch has two assistants, namely, Samuel Heiman, and I. William Marcovitch. One of whom, Mr. Marcovitch, reported on the committee's idea that the Branch persuade one of the Libraries, either Mercantile or the Free Library to have a separate installation for books and periodicals concerning Electroplating.

Motion—The Librarian Committee be given the power to make the best arrangement with a Library to house the various books and periodicals of the Branch. Carried.

There was quite some discussion on the Los Angeles letter.

Librarian Al Hirsch introduced the speaker of the evening, Samuel Heiman, graduate chemist and a member of the Branch; whose subject was Industrial High Speed Gold Electroplating.

Mr. Heiman gave a short history of Gold Plating, stressing the fact that jewelry was plated to a thickness of approximately .00002" and with the High Speed for "Radar" with a thickness of .0003".

The speaker answered the many questions of all and President Zurbach called for a rising vote of thanks.

President Zurbach gave the members a pep talk and assured them a very entertaining year, both educational and social.

The bills were ordered paid and the meeting adjourned at a late hour

PAUL MENTZER, SR., *Sec'y*

TORONTO BRANCH

The regular monthly meeting of Toronto Branch A.E.S. was held Friday, June 9th, at 8:00 p.m., in the Club Rooms of the Royal York Hotel, with President Allen Byers presiding. W. Price, Sergeant-at-Arms, read the record of attendance for the past year, and the results were not as good as they could be. Members are urged to make this a banner year for attendance. Your Executive has an excellent programme of speakers for the coming year, and it remains for you to come out and hear these men, who are giving so freely of their time and talents.

Under unfinished business, Mr. Byers opened the discussion of identification discs for every member in attendance. Mr. Jack Acheson was asked to purchase the required number, as per the sample submitted.

After the regular business, Mr. Byers asked T. Boaz to read the paper, "A Comparison of the Properties of a Passivated and a Plain Zinc Surface," by Frank Taylor, one of our English members. This paper, first presented in "Sheet Metal," an English trade journal, bore the evidence of much painstaking work. The members showed their appreciation of Mr. Taylor's efforts, and Mr. Byers suggested we send the paper to the "Review", for republication.

Before I close this report, I should like to mention a few of the thirty-five Canadians who attended the Cleveland convention: Messrs. Jack Acheson, Arthur West, E. P. Blandy, A. Smith, W. Price, Gordon Hathaway, R. Davidson, Jack Reisenberg, J. Feeley, Allan Byers, W. Young, Art Johnson, James

Heslin, Frank Oakley, George Harris, Charles Emberley, Gordon Giles, Mr. and Mrs. Harry Hands, Mr. Walter Barrows (our branch delegate), Messrs. J. Walker, D. Wyatt, and others. Toronto Branch is justly proud of its representation at this, and other, conventions, although there was some comment on our usurping the aboriginal cognomen of the Cleveland Baseball Team. However, I interpreted this as rather clumsy propaganda from the Montreal District.

The old familiar faces, with a few exceptions, were there—Blum, Hogaboom, Phillips, among others. A few of us from Canada, looking for a little fun, asked Wilfred S. McKeon, the jovial "Liquid Sulphur" man, if he knew of a good method of stripping copper.

Mac took it in good fun, and, what is more, proved to our satisfaction that he did have this information. More power to you, Mac! The Canadians came home, tired, but happy, in the memory of old friendships renewed and new ones made.

THOMAS BOAZ,
Recording Secretary

DAYTON BRANCH

The June meeting was held at the Engineer's Club on the 9th. One of our own branch members, Mr. Frank Kline, was the speaker. His topic was "Cyanide Zinc Plating of Cast Iron."

Mr. Kline described an automatic set-up used by his firm. The castings are first given an anodic clean in a solution without metasilicate, rinsed, pickled in 75 per cent muriatic acid, rinsed, dipped in a hot cyanide-caustic solution, given a strike in the plating solution, and then plated. The striking is done by cutting the first seven feet of the anode bar and connecting it directly to the generator, while the rest of the tank is controlled by rheostats.

Samples which were passed around the group proved that the process produced an excellent job. The throwing power and coverage were very good. In answer to a question, Mr. Kline stated that, in his opinion, the two most important factors were the pickle and strike.

The discussion following the paper was lively and interesting, almost every member having questions or experiences to present. Other topics which came up during the discussion were the old salt spray question, treatment of zinc coatings, and the new plating method which superimposes an alternating current on the direct cuurrent. According to the information presented this new method shows promise in cutting plating time and in producing bright deposits.

HERMAN E. AUSTEN, *Reporter.*

MONTREAL BRANCH

The Montreal Branch A.E.S. held their regular meeting at the Mount Royal Hotel on Monday, March 4. Mr. Reisenburg, the President was in the chair and due to the absence of the Secretary, Mr. R. E. Gordon was requested to act as Secretary.

It was decided to hold a stag dinner similar to the one held last year. Mr. Day and Mr. Crawford were appointed joint Chairmen by the President. May 8th was set as the most appropriate date for the dinner.

The Montreal Branch had the pleasure of two visitors in the persons of Dr. R. Blais of Ecole Polytechnique of Montreal and Mr. A. Severs of Toronto.

The President threw the meeting open for general discussion on plating problems and this continued until 11:15 when the President adjourned the meeting.

WILLIAM G. FINLAY, *Secretary.*

HARTFORD BRANCH

The May meeting of the Hartford Branch of the A.E.S. was held at the Stanley Golf Club, New Britain, Conn. The meeting was arranged as a purely social function to wind up a season of exceptionally fine educational sessions arranged for by our competent librarian, Harry Sanders.

Many of the members and guests present played a round of golf before dinner while the rest indulged in softball and beer drinking. A fine steak dinner was served at 7:30. Anyone who left the table hungry or dissatisfied had only himself to blame as the chef, Roy Carvell, really outdid himself to make the meeting a success. After dinner, cigars were passed out and the members and guests played cards for the rest of the evening.

F. W. SMITH, *Secretary.*

TORONTO BRANCH

The regular monthly meeting of Toronto Branch A.E.S. was held Friday, May 12th, in the club rooms at the Royal York Hotel with President Allan Byers in the chair.

There was a good turnout of members and the meeting got away to a good start at 8:15 p. m.

Three candidates were elected to membership: Robert Francis Wheeler, Toronto, Ontario; William Thompson, Weston, Ontario; and George T. Smith of London, England.

Under unfinished business, Mr. Byers reported on the executive findings relative to the Montreal Branch's proposed amendments to the constitution. The feelings of the Executive, which the members endorsed, were not in agreement with Montreal Branch on all counts, but we do agree that active members should not lose their status when they cease to be active in electroplating.

Note was taken of our "coming of age" in that we have passed well over the hundred mark in our Memberships.

After the business of the evening had been concluded, President Byers called on Mr. E. Blandy, Chief Chemist of Small Arms Limited, to read his paper "Plating on Plastics."

Mr. Blandy's talk, although lasting the better part of an hour, was hardly long enough. His presentation on the subject was masterful and the general consensus was that we will do well to persuade Mr. Blandy to favor us in the near future with "some of the same."

Mr. Byers moved a hearty expression of appreciation and the members responded enthusiastically.

Under Good and Welfare it was duly moved and seconded that the Librarian prepare a report on the attendance for the past year to be read at the June meeting. The motion was carried and the meeting adjourned at 10:45 p.m.

THOMAS BOAZ, *Recording Sec'y.*

NEWARK BRANCH

The regular meeting of the Newark Branch A.E.S. was held at the Robert Treat Hotel, Newark, N. J. on May 5th, 1944. The meeting was called to order by President Robert Sizelove. All other officers were present.

The minutes of the previous meeting were read and approved.

The applications for Associate Membership of Harold Buckingham and Bennie J. Pedota were voted to take the regular course.

Mr. Paul Oldam, Chairman of the Exhibits Committee, reported that very few members had answered his call for exhibits for our convention in June. He asked that all members have their exhibits ready for our next meeting on May 19th.

Ed Washburn gave a very interesting discussion on coloring aluminum, which was anodized, in a chromic acid bath. He exhibited numerous samples which appeared to have very satisfactory colors. He next conducted a question box, which was both interesting and beneficial.

The meeting was adjourned at 11:00 p.m.

The regular meeting of the Newark Branch A.E.S. was held at the Robert Treat Hotel, Newark, N. J., on May 19th, 1944. The meeting was called to order by President Robert Sizelove at 8:30 P.M. All other officers were present.

The minutes of the previous meeting were read and approved. Several bills presented were approved and voted to be paid. Several communications were read and placed on file.

Paul Oldam reported on his Exhibits Committee for the June Convention and it appears that Newark Branch will be represented by several Exhibits. Paul Oldam read the report of the Audit Committee which was approved most heartily.

Our Librarian Edward Washburn, discuussed the 1944-45 Year Book with the members and asked their opinions as to what additions should be made. It appeared from the discussions that quite a number of new finishes will be published in this book. The members promised that they would cooperate in every way in furnishing material to make this book outstanding.

Ed Washburn further reported that he anticipated a class of 15 members or more to take up some phase in chemistry or electroplating at Newark Tech.

It was voted upon that during the months of July, August and September, Newark Branch will hold one meeting on the third Friday of each month.

The re-instatement of John B. Van Zandt was brought before the members and was approved.

The meeting was adjourned at 11:00 P.M.

GEORGE WAGNER, *Sec'y.*

SPRINGFIELD BRANCH

The regular monthly meeting of the Springfield Branch A.E.S. was held at the Hotel Charles on April 24th at 8:00 P.M. The meeting was called to order by President Plank. The minutes of the previous meeting were read and approved.

The Secretary displayed a sample copy of the membership certificate that will be furnished each member free of charge by the National Society.

The Secretary read proposed amendments to the constitution which will be voted on by the delegates at the Cleveland Convention. The delegates were instructed to listen to the discussion and then use their own judgment.

As a further step in reducing the per capita tax of the Branches and because of increased membership and savings in publishing the MONTHLY REVIEW, Mr. Clark made the motion that the Springfield Branch sponsor an amendment to lower the per capita tax from 45 per cent to 25 per cent. The Newark Branch is sponsoring the amendment which advocates a per capita tax of 35 per cent.

The Nominating Committees unanimously presented the following slate for the 1944-45 Springfield Branch officers: President, Colin Hastie; Vice-President, Art Copp; 2nd Vice-President, Fred Hampson; Secretary and Treasurer, Paul Lyman; Board of Managers, T. J. Murray, Fred Sheehan, P. W. Prouty; Librarian, Frank Clark.

Mr. Clark then introduced the speaker of the evening, Mr. Robert Sizelove, engineer from the Frederick Gumm Chemical Co., Kearny, N. J. Mr. Sizelove's subject was the Promat Process. He presented an interesting picture of the advantages of superimposed A. C. current on D. C. current, explained its advantages and limitations. The talk was thoroughly enjoyed by all members and guests and he was given a rising vote of thanks.

The meeting adjourned at 10:30 P.M.

The May meeting of the Springfield Branch, American Electroplaters' Society was held on the 24th at the Hotel Charles, Springfield, Mass. The meeting was called to order by ex-President Costigan. The minutes of the previous meeting were read and approved.

The names of the following applicants for associate membership were read. The move was made and seconded that their names be placed on file until the next meeting. They are: Raymond P. Senecal, 208 Porter Rd., E. Longmeadow, Mass. and William A. Pyne, 349 King St., Springfield, Mass.

The following slate for officers of the 1944-1945 year was read: President, Colin M. Hastie; Vice-President, Art Copp; 2nd Vice-President, Fred Hampson; Secretary-Treasurer, Paul Lyman; Board of Managers, T. J. Murray, Fred Sheehan and P. W. Prouty; Librarian, Frank Clark. A ballot was cast and the entire slate was unanimously elected.

Mr. Hastie then was installed as president and he appointed the following delegates: Colin M. Hastie, Art Copp and William Seidel; Alternates, Paul Lyman, P. W. Prouty, and Derick Hartshorn, Jr.

The meeting was adjourned at 10:00 P. M.

D. S. HARTSHORN, JR. *Sec'y.*

SYRACUSE BRANCH

The Syracuse Branch had a regular meeting on Friday, May 26, in Bowne Hall, Syracuse University. Dr. N. F. Murphy, our president, opened the meeting at 8:00 P.M.

The minutes of the previous meeting were read and accepted.

Following the reading of the minutes, there was a discussion of the Amendments to the constitution proposed by the Newark and Montreal Branches. It was decided to instruct our delegates how to vote on these amendments at the national convention. Motions were made and passed that our delegates be instructed to vote in favor of the Newark amendment and in favor of Amendment 12 as proposed by the Montreal Branch.

Mr. Robert R. Sizelove of the Frederick Gumm Chemical Co., Inc. was our speaker for the evening. Mr. Sizelove gave talks on "Tumble Deburring" and on "Electroplating with Superimposed Alternating Current." Both talks were very interesting and well received. The principles and mechanics of operation of the tumble deburring process were outlined along with the possible applications and limitations of the process. A number of samples were shown which illuustrated the use of tumble deburring for the removal of fins and burrs on both metal and plastic parts.

The speaker outlined a few of the ex-

periments he had carried out in superimposing alternate current on direct current in the zinc plating process. Some of the advantages resulting from the use of superimposed a.c. were: 1 — Higher anode corrosion; 2—Lower hydrogen overvoltage; 3—Better current distribution; and 4—Parts do not burn. Mr. Sizelove offered the prediction that in the future, through the use of superimposed alternating current of controlled frequency, it may be possible for the plater to get perfect current distribution so that a part would have just as much plate in the recesses as on the projections.

NEIL C. MAFFEI, *Sec'y*

CHICAGO BRANCH

The regular monthly meeting of Chicago branch was held Friday, June 9, 1944 at the Atlantic Hotel.

President R. J. Hazucha presiding and all Officers present.

President Hazucha appointed Mr. J. Mintz as sergeant-at-arms for the fiscal year 1944-45. Jake really does a good job, and never misses a meeting.

Acting on the advise of his doctor to reduce some of his work and activities, J. W. Hanlon resigned as Secretary-Treasurer, while Jim considered it an honor and a pleasure to work as Secretary for Chicago branch, he feels that he should obey the doctor's orders. Jim wishes to thank each and every member of Chicago branch for the fine co-operation given him during his several terms of office.

At the suggestion of President Hazucha, Mr. Hanlon was allowed the honor of nominating his successor Mr. M. H. Longfield, who was elected as Secretary-Treasurer for the balance of the fiscal year. Mr. Longfield was Secretary in 1938 and we all feel sure that he will carry on the work in perfect order.

Mr. Carter our new librarian introduced the guest speaker of the evening, who is also a member of Chicago branch, Mr. S. P. Gary, Jr. of the Scientific Control Laboratories who made a very interesting and instructive talk on "Non-Decorative Silver Plating." Mr. Gary answered many questions asked by those present.

The following questions were found in the question box.

1. Will a variation in voltage at a low current density change the cathode efficiency.

Answer: Yes. Under ordinary conditions.

2. What strip can be used to remove a nickel and copper deposit from steel without loss of dimensions.

Answer: It was suggested that 3 to 4 lbs. per gal. of Sodium Nitrate per gal. with reverse current, or use a sulphuric strip to take off the nickel, then a cyanide strip for the copper.

3. How many amps. per sq. foot is used on a silver strike?

Answer: Usually 20 to 30 amps. per sq. foot.

There were 65 in attendance at this meeting which adjourned at 10 P. M.

M. H. LONGFIELD, *Secretary.*

BOSTON BRANCH

Boston branch met Thursday, June 1st at the Statler Hotel, Boston with President George P. Swift in the chair.

Minutes of the previous meeting read and approved, communications read and placed on file, bills read ordered paid.

Two applications approved by the board of managers were elected to membership: Ben Silverman, 13 Oakhurst St., Dorchester, Mass., and Edward J. Ellis, Boston Machine Works Co., Lynn, Mass.

The election of officers was held and the following were elected: President, George P. Swift; 1st Vice-President, Robert Magnuson; 2nd Vice-President, Ernest Callahan; Secretary-Treasurer, Andred W. Garrett; Librarian, Leonard A. Chesworth; Board of Managers, Charles O. Hardy, Harry J. Lack and Arthur W. Collins, and Sergeant-at-Arms William B. Harvey.

The new officers were inducted by Past President Charles O. Hardy. He gave a little talk on the great work done in the past years by all the officers of the branch and wished the new officers a very successful year.

There being no speaker a general discussion was in order for one hour with all the members getting into it.

Meeting adjourned at 10:30 P.M.

A. W. GARRETT, *Sec'y-Treas.*

DAYTON BRANCH

The Dayton Branch had a stag party for members and prospective members on Friday night, May 12, at the Miami Hotel. The members enjoyed themselves with games and refreshments, including an excellent buffet lunch.

During a short business session the majority opinion of the members was requested to guide the delegates in voting on the proposed amendments at the convention. The majority opinion was that no change should be made in the name of the Society, that the per capita tax should remain the same, and that one of the three delegates should be an associate member.

HERMAN E. AUSTEN, *Reporter.*

BRIDGEPORT BRANCH

The regular monthly meeting of the Bridgeport Branch of the American Electroplaters' Society was held Friday, May 5, 1944 at the Hotel Barnum. President A. R. McNeil opened the meeting at 8:30 P.M. with 32 members present including guests from the New Haven Branch.

The roll call of officers was read and all were reported present. The minutes of the previous meeting was read and accepted.

Reports of Special Committees: F. J. Kalafus, Chairman of the Exhibit Committee, reported that their work is in the final stage of completion.

R. J. O'Connor gave us a complete report of a successful Regional Meeting which was held in New Haven at the Hotel Bond, April 22, 1944.

Reports of Standing Committees: F. B. Gotthardt reported the demise of Mrs. O'Connor of Waterbury, mother of our dear friend and member, R. J. O'Connor. With deep regret and sympathy a floral offering was sent to the bereaved family by the members of the Bridgeport Branch.

H. M. Goldman, 2nd Vice-President and Chairman of the Membership Committee, reports good progress is being made in securing members to our Society.

Projector Committee reports that the projector has been loaned out to some of the members of the Branch and the final reports prove that the investment in the purchase of the machine is successful.

F. B. Gotthardt, Librarian and Chairman of the Technical Sessions Committee, reports that an open meeting will be held in Stamford, Conn., May 19, 1944 at 8:00 P.M. with Dr. Walter Meyer, Director of the Enthone Company of New Haven, speaking on Copper Plating in all its phases. As we know this will be a very fine talk and all the members and friends are urged to attend this meeting and at the same time show our Stamford boys that we appreciate their active participation in the Bridgeport Branch.

Don't forget, Yale and Towne Auditorium, Stamford Conn., May 19th at 8:00 P.M.

Delegates elected to the National Convention to be held in Cleveland, Ohio, June 1944 are as follows:

Delegates: Clarence C. Helmle, Raymond J. O'Connor, Arthur R. McNeil.

Alternates: John E. Charleson, Axel Boggild, Joseph G. Sterling.

Communications: A letter from Jack Bain, our publisher of the REVIEW, stating that certificates of membership can be obtained from the National Office to all members desiring them gratis. If interested, please contact your secretary.

A card of deep appreciation from the family of Mrs. Catherine O'Connor.

A letter from the Newark Branch regarding proposal of an Amendment to the By-Laws, Section 3 of Article 4 of Part 1, to change the amount of the Per Capita Tax. The Branch voted to give power to our delegates to use their own discretion.

A letter from M. T. Vreeland submitting his resignation as other work and interests have made demands on his time and is no longer connected with the Plating Industry.

A letter from Los Angeles, California Branch with contents noted. It was voted to give power to our delegates to use their own discretion.

A letter from the Montreal Canada Branch regarding Amendments to the Constitution. The delegates were ordered to use their wisdom and discretion in voting for the changes as requested by the Montreal Branch. Therefore, full powers were accorded to the delegates of the Bridgeport Branch.

Publicity Committee appointed by President A. R. McNeil, are as follows:

Herman C. Braun, Hubert M. Goldman — Stamford and vicinity; Frank

J. Kalafus, A. R. McNeil — Bridgeport and vicinity.

Hubert M. Goldman, Chairman of the Membership Committee, appointed the following to the Membership Committee:

J. McGrath, V. Consalvo, Frank Rock, Edward Hill.

President A. R. McNeil, appointed the following to the Sick Committee:

R. J. O'Connor, Chairman; J. G. Sterling, F. J. Kalafus, John Schneider.

President A. R. McNeil, appointed the following to the Projector Committee:

Floyd Erlenmeyer, Clarence C. Helmle, Raymond J. O'Connor.

The delegates to the Cleveland, Ohio Convention have received their final instructions and the Branch has approved to pay them their registration fees.

Bills against the Branch were ordered paid.

Good of the Order: "Doc" Meyer tells us that our meetings are good. He has been around and says that he certainly finds our meetings progressive and interesting. Now tell us what finer and better compliments can we get from anyone. Thank you "Doc."

The Treasurer's report was read and accepted.

After the meeting refreshments were served which were enjoyed by all the members and guests present.

Meeting adjourned at 11:00 P.M.

The Bridgeport Branch of the A.E.S. held its monthly open meeting at the Yale and Towne Auditorium in Stamford, Conn., on Friday evening, May 19, 1944 at 8:00 P.M.

President A. R. McNeil, opened the meeting and introduced all of the officers to the members and guests present which numbered to about 70. It was fine to see such a fine assemblage of men to hear Dr. Walter R. Meyer, Director of the Enthone Company, New Haven and a member of the Bridgeport Branch, speak on Copper Plating in all its phases.

Dr. Meyer was introduced to the audience by President A. R. McNeil. He talked on copper plating and slides were shown which were narrated by Dr. Meyer, these slides showed various forms of deposits of copper. It certainly was good to see a nice turn-out for a talk on plating. After the talk, Dr. Meyer asked for a discussion on the subject and after this discussion a rising vote of thanks was accorded to him.

We may also mention good thanks to Ed Charleson and the rest of the Stamford boys for a nice audience and to thank Ed for getting a fine place to hold a meeting.

We were very glad to have Mr. Dalton, Manager of the Yale and Towne Company for his fine talk and cooperation and we thank him for his courteous action toward the members of the Bridgeport Branch. Pictures later were shown on "Guns and Proper Care of Them," including dismantling and assembling of same. It indeed was a very fine meeting and enjoyed by all who have attended.

Meeting adjourned at 11:00 P.M.

An Open Meeting and Educational Session was held March 17, 1944 at 8:00 P.M. at the Barnum Hotel with 42 members and guests present. President A. R. McNeil opened the meeting and introduced Mr. Ed Bucy of the Zapon Division of the Atlas Powder Co. who spoke on "Post-War Planning of Organic Finishes and Organic Finishing to Government Specifications." Mr. Bucy possesses a thorough knowledge of Organic Finishing and has been in constant contact with Washington, D. C. pertaining to paint finish specifications and formulas. He has given us a good picture of the present finishing and what can be done in the future. Many questions were asked and Mr. Bucy certainly knew the answer. The meeting was interesting to all the people present and gave Mr. Bucy a rising vote of thanks for his fine talk. After the meeting refreshments were served which was enjoyed by all present.

Meeting adjourned at 11:15 P.M.

J. G. STERLING, *Sec'y & Treas.*

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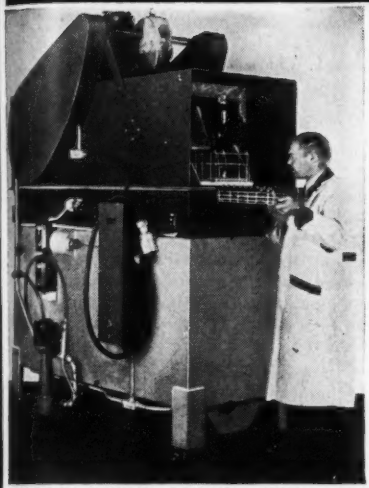

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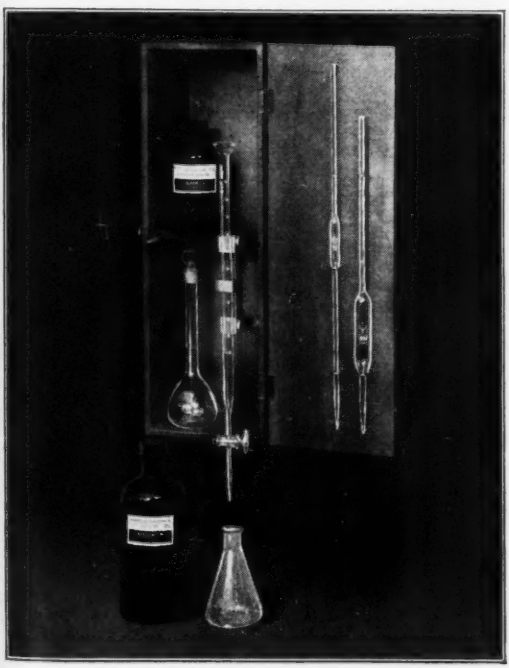

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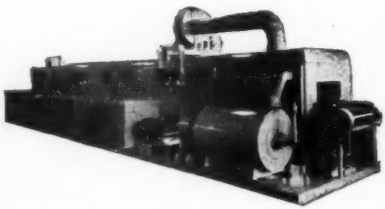

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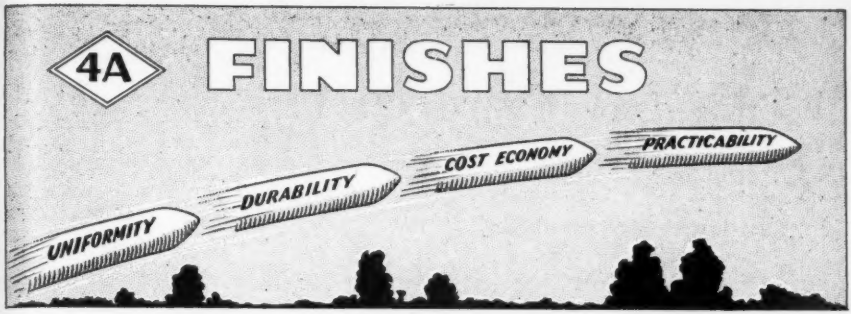

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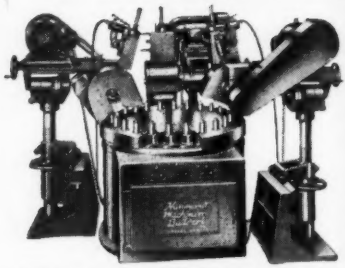

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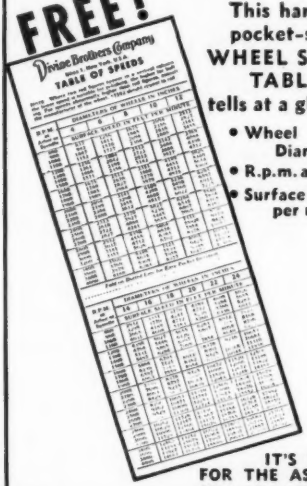

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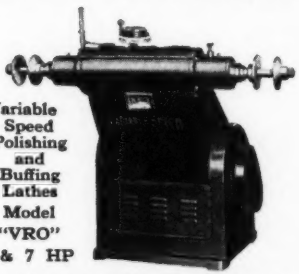

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FRANK K. SAVAGE

Chairman, Membership Committee

To July 1944

ELECTIONS

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BEN SILVERMAN, 13 Oakhurst Street, Dorchester 24, Mass., Active
EDWARD J. ELLIS, Boston Machine Works Co., 7-17 Willow St., Lynn, Mass., Active

Chicago Branch

F. H. SANDERS, 1019 Nelson St., Fort Wayne, Ind., Active
M. DASSINGER, 2555 N. Austin Ave., Chicago 39, Ill., Active
H. E. ROGERS, 1400 Wrightwood Ave., Chicago 14, Ill., Active
F. DASSINGER, 2032 Seminary Ave., Chicago 14, Ill., Active
P. LAWKIS, c/o National Mineral Co., 2638 N. Pulaski Road, Chicago 47, Ill., Active
S. PESTONE, c/o National Mineral Co., 2638 N. Pulaski Road, Chicago 47, Ill. Active
VON R. KAUFMAN, c/o Whittery Products, Inc., Pierceton, Ind., Associate
J. F. KEILEY, 53 W. Jackson Blvd., Chicago, Ill., Associate
C. E. WALSH, Vacuum Can Co., 25 S. Hayne Ave., Chicago, Ill., Active
N. E. GARMAN, 147 S. Yale Ave., Villa Park, Ill., Associate
H. BURNSON, 4014 W. Parker Ave., Chicago 39, Ill., Associate

Cincinnati Branch

ISAY A. BALINKIN, University of Cincinnati, Cincinnati, Ohio, Active
MAURICE J. KRANE, 6734 Fieldhouse Way, Mariemount, Ohio, Active

Detroit Branch

WILBUR J. BUTLER, 1129 N. Wilson, Royal Oak, Mich., Associate
FRED O. JOHNSON, Davison, Mich., Active
ALVIN A. BALDAN, 872 Hartsough St., Plymouth, Mich., Associate
AUSTIN H. BEEBE, JR., 1808 Dexter, Ann Arbor, Mich., Associate
WALLACE R. IVERS, 653 Dubois, Detroit 7, Mich., Active
CHARLES J. FORRESTER, c/o Plymouth Motor Co., 6334 Lunch Road, Detroit 5, Mich., Active
DANIEL J. GENTILE, 9623 Berkshire Road, Detroit 24, Mich., Active
CHARLES N. ISACKSON, 520 N. Farragut St., Bay City, Mich., Associate
ERNEST S. LOSEY, c/o Wagner Brothers, 1249 Holden, Detroit 2, Mich., Associate
E. H. McCOLLUM, 18257 Rutherford, Detroit 19, Mich., Active
EMANUEL STARKEL, College Hotel, Flint, Mich., Active
HERBERT R. WILLIS, c/o Plymouth Motor Co., 6334 Lynch Road, Detroit 5, Mich., Active

Los Angeles Branch

ROBERT VERNON BURDEN, 3370 Cozador St., Los Angeles, Calif., Active
VAN A. PARKER, 836 Columbia, San Diego, Calif., Active
WALTON A. FELKER, 1527 Post Ave., Torrance, Calif., Associate
JOHN NEERHOUT, c/o Rheem Mfg. Co., 714 W. Olympic Blvd., Los Angeles, Calif., Associate
WOODROW W. CROWLEY, 1358 W. Washington Blvd., Los Angeles, Calif., Active

HAROLD GIBBONS, 530 Westmount Drive, Los Angeles 36, Calif., Associate
JOSEPH W. HANZEL, 3585 Wonderview Drive, Hollywood 28, Calif., Associate
GUY E. PEARSON, Florence Branch, Box 4862, Los Angeles, Calif., Active
CECIL L. WILSON, Pacific Div., Bendix Aviation Corp., 11600 Sherman Way, North Hollywood, Calif., Active
JACK A. CONNELL, 209 N. Howard, Glendale, Calif., Active

Newark Branch

METALDO DETZE, Ingersoll Rand Co., Metallurgical Department, Phillipsburg, N. J., Active
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RESEARCH COMMITTEE

The Research Committee held a meeting with those present at the Convention Wednesday noon to discuss the status of the research work and plans for the future. It was felt that although the work could not be started again because of the war conditions, it would be wise to publish the material now complete and to make plans for the future.

The new President, Mr. Caldwell, appointed Mr. C. E. Heussner of the Chrysler Corporation as Chairman. Mr. Heussner will appoint his own committee and actively take over the direction of his work.

E. T. CANDEE

Announcement

It has been pointed out to the Editors that a technical article which appeared in the June REVIEW suggested Editorial approval of a proprietary product.

The Editorial pages of the REVIEW are open to an exchange of views but this does not carry the assumption proprietary products are favored.

MEMBERSHIP CHART

BRANCH	May 1943	Change in Membership	Percent Change
SYRACUSE	51	+ 8½	+16.6
INDIANAPOLIS	74	+ 9	+12.
LOS ANGELES	123	+10	+ 8.1
NEW HAVEN	95	+ 6	+ 6.3
TORONTO	109	+ 6	+ 5.5
PROV.-ATTLEBORO	66	+ 3	+ 4.5
BOSTON	130	+ 5	+ 3.9
PHILADELPHIA	138	+ 5	+ 3.6
DETROIT	336	+11½	+ 3.4
CINCINNATI	63	+ 2	+ 3.1
DAYTON	100	+ 3	+ 3.
BRIDGEPORT	102	+ 3	+ 2.9
NEW YORK	158	+ 4½	+ 2.8
WATERBURY	111	+ 3	+ 2.7
CHICAGO	323	+ 8	+ 2.4
SAN FRANCISCO	39	+ 1	+ 2.
GRAND RAPIDS	109	+ 2	+ 1.8
NEWARK	198	+ 3	+ 1.5
BUFFALO	80	+ 1	+ 1.2
ROCHESTER	83	+ 1	+ 1.2
MILWAUKEE	97	+ 1	+ 1.
CLEVELAND	115	+ 1	+ .86
BALTIMORE-WASH.	107	+ ½	+ .46
HARTFORD	114	—	—
ST. LOUIS	111	—	—
SPRINGFIELD	79	—	—
PITTSBURGH	68	—	—
JACKSON-LANSING	51	—	—
TOLEDO	42	—	—
ANDERSON	23	—	—
MONTREAL	50	— 2	— 4.
LANCASTER	40	— 2	— 5.

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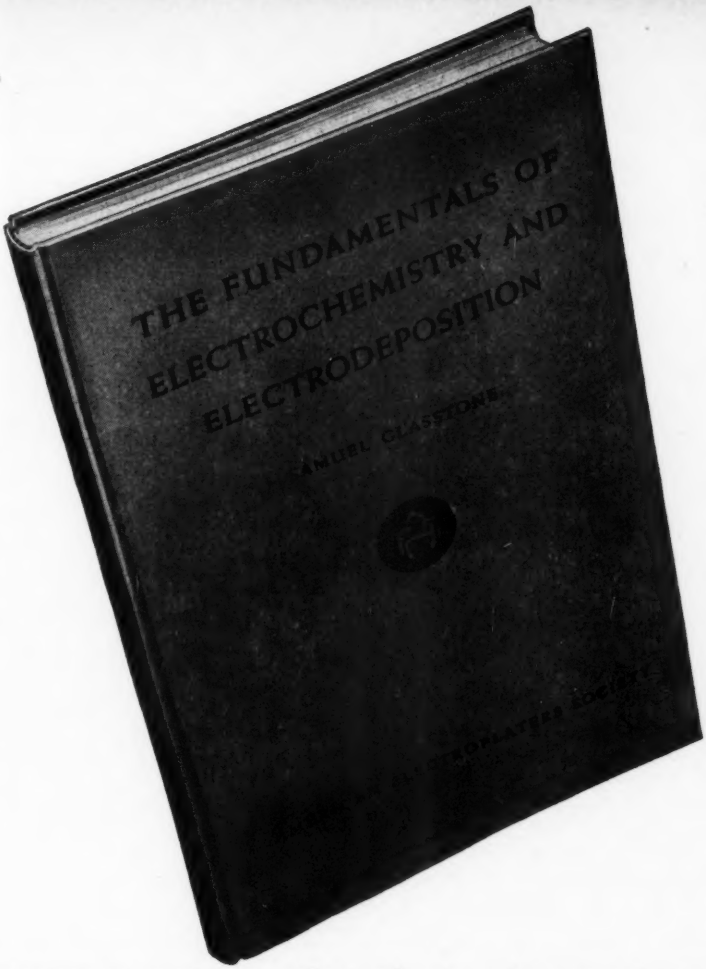

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BOOK DEPARTMENT

BOOK REVIEWS

By

DR. GEORGE DUBPERNELL, *United Chromium, Inc.*

TECHNICAL TRANSLATIONS

Instead of the usual book review this month, it was decided to call attention to some of the technical translations which have been made available the last few years by Mr. Henry Brutcher of Altadena, California, and which may also be purchased through A.E.S. Headquarters in New York at the same price. These translations of foreign technical articles from French, German, and Russian sources are sometimes the means of obtaining some specialized information which was published in the foreign language. This is a relatively expensive source of information, but is often valuable to research workers and others interested in a particular article published in a foreign magazine. Mr. Brutcher's price for his translations is generally about $1.00 per 1000 words, with something additional for the reproduction of figures and tables in many cases. This is only a fraction of the cost of having a special translation made for an individual. The translations are neatly mimeographed with double spacing and generally two copies of illustrations, one of which is loose and can be used as a book mark, and to check from page to page. They are firmly bound in letter file folders for ease in handling and filing.

Generally about one or more translations are published each month relating to electroplating and metal finishing. Mr. Brutcher sends out a monthly abstract bulletin describing his newest translations free of charge to all who request it. He also has free catalog sections describing the translations on particular subjects, some of which are:

No. C-13 — Pickling of Steel
No. C-23 — Hot Galvanizing
No. C-58 — Phosphate Coating
No. C-60 — Corrosion Problems, Tests, etc.
No. C-61 — Electroplating
No. C-73 — Aluminum Coatings on Steel
No. C-74 — Metallic Cementation
No. C-75 — Hydrogen in Steel
No. C-106 — Clad Steel
No. C-115 — Vitreous Enamels
No. C-130 — Pickle Liquor Disposal
No. C-147 — Pickling Inhibitors
No. C-151 — Pickling Equipment
No. C-182 — Corrosion Tests
No. C-188 — Electrolytic Polishing
No. C-189 — Electrolytic Pickling
No. C-190 — Metal Spraying
No. C-193 — Chemical Pickling of Steel
No. C-198 — Chromium Plating of Metals
No. C-229 — Pickling of Steel Sheet
No. C-242 — Zinc Plating of Steel

Some of Mr. Brutcher's more recent translations are listed or described below as typical examples. Anyone desiring further information regarding a particular translation can obtain an abstract of it free of charge upon request. Descriptions of most of these articles can also be located in Chemical Abstracts or other abstract journals.

No. 1549. "Decorative and Corrosion Resisting Coatings," by V. M. Yefimov, from Vestnik Metallopromishlennosti 20, No. 7, 1940, 1 figure, 1 table, 950 words. Price $1.35. Tests of the resistance of chromium, nickel-

chromium, nickel, and zinc plate on locomotive handrails exposed to smoke gases.

No. 1543. "On the Friction of Cast Iron Against Chromium Plated Steel," by M. Kontorovich and V. Arkharov, from Vestnik Metallopromishlennosti 20, No. 10, 1940, 2 figures, 1750 words. Price $2.65.

No. 1525. "Wear Resistance of Chromium Plates," by V. I. Arkharov, A. M. Zagrubski and S. A. Nemnonov, from Vestnik Metallopromishlennosti 20, No. 10, 1940, 3 figures, 1 table, 2300 words. Price $3.45.

No. 1513. "Chromium Deposition from Chromic Acid Solutions in Production Plating," by R. Bilfinger, from Korrosion und Metallschutz 17, No. 8, 1941, 4400 words. Price $5.50.

No. 1512. "Lead Plating from Solutions of Complex Lead Salts," by A. Glazunov and L. Jenicek, 500 word abstract of an article in Korrosion und Metallschutz 17, 1941. Price $1.00.

No. 1483. "On The Degasification of Chromium Deposits by The Intermitta Process," by K. Sachtleben, from Korrosion und Metallschutz 19, 1943, 1 table, 1500 words. Price $2.25.

No. 1481. "Contribution to The Hard Chromium Plating of Aluminum and Its Alloys," by A. Beerwald, from Aluminum 23, 1941, 11 figures, 1 table, 4300 words. Price $6.45. An experimental study of the bonding of chromium deposits on aluminum with different etching treatments for different aluminum alloys.

No. 1480. "Addition of Cadmium to Hot-Dip Galvanizing Baths," by H. Bablik, F. Goetzl, and R. Kukaczka, from Korrosion und Metallschutz 19, 1943, 21 figures, 6 tables, 3100 words. Price $3.85.

No. 1469. "Running Properties of Piston Rings Improved by Phosphate Coating," by F. Bremer, from Korrosion und Metallschutz 17, 1941, 8 figures, 950 words. Price $1.20.

No. 1385. "Experiments on Hard Chromium Plating High Speed Tools," by H. Balster and W. Lemcke, from T. Z. Praktische Metallbearbeitung 52, 1942, 10 figures, 6 tables, 2500 words. Price $3.10.

No. 1357. "Experimental Study of the Crystalline Structure of Electrolytic Deposits," by P. Jacquet, from Revue de Metallurgie 35, Nos. 2, 3, and 4, 1938, 1400 word abstract only, with 6 figures. Price $1.75.

No. 983. "Corrosion Resistance of Zinc Electroplates," by M. Schlotter, from Stahl und Eisen 60, 1940, 4 figures, 1 table, 2300 words. Price $2.30.

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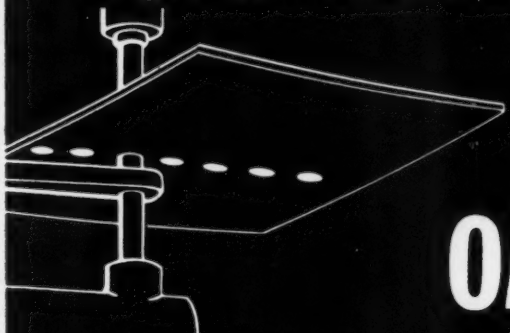

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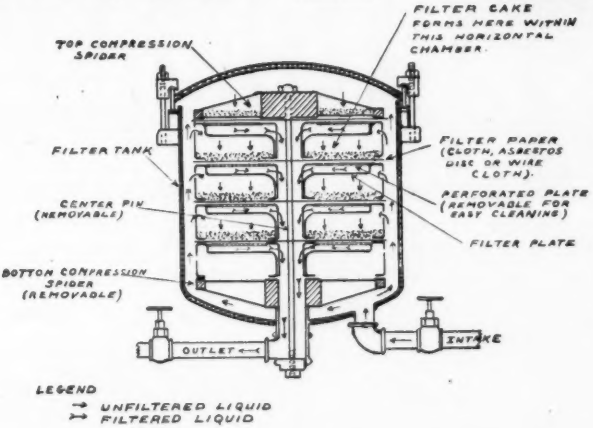

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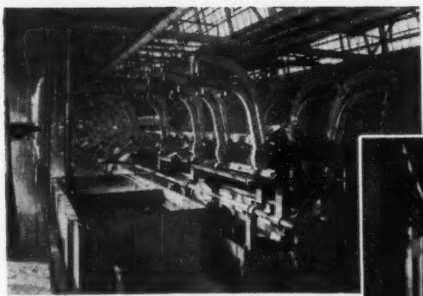

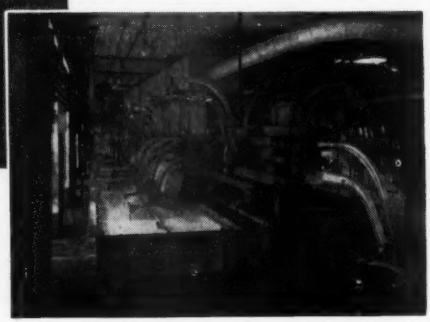

Prior to Pearl Harbor, many plants began to quickly and economically convert their Stevens Equipment from peace- to war-time production.

We still have a war to win, and, if we can be of assistance to you in helping to speed the day of complete victory, please call upon us.

If and when you contemplate reconverting your present equipment, or, the addition of new equipment for peace-time production, we shall be glad to discuss your plans with you—study your operations and make our suggestions and recommendations.

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